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BIRDS and NATURE

IN NATURAL COLORS

A MONTHLY SERIAL

FORTY ILLUSTRATIONS BY COLOR PHOTOGRAPHY

A GUIDE IN THE STUDY OF NATURE

Two Volumes Each Year

VOLUME XIII.

January, 1903, to May, 1903

EDITED BY WILLIAM KERR HIGLEY

CHICAGO
A. W. MUMFORD, Publisher
378 Wabash Avenue
1903

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The beautiful is as useful as the useful.—*Victor Hugo.*

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EDITED BY WILLIAM KERR HIGLEY.

ILLUSTRATED BY COLOR PHOTOGRAPHY.

$1.50 a Year. 15 Cts. a Copy.

A. W. MUMFORD, Publisher

203 Michigan Ave., Chicago, Ill.

BIRDS AND NATURE

MONTHLY, EXCEPT JULY AND AUGUST.

TERMS AND CONDITIONS OF PUBLICATION:

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VOL. XIII. JANUARY, 1903 No. 1

TO NATURE.

Thou art a friend, that ever bides with me,
  Steadfast as sun today or moon tonight,
  Or as the stars which shed revealing light
O'er dusky meadow and mysterious sea.
Many wise lessons have I learnt of thee;
  The winds have been my teachers, and the flowers,
  The snows of winter, and the vernal showers,
And white clouds sailing tranquilly
Above my head, 'cross heaven's radiant face.
  O joy to know thy ministering servants move
  In my behoof on tireless steps of love!
Heart-discord now to calm has given place.
  I would be true to thee, my heart to thine—
  The feebly human to the Strong Divine.
—William Cowan, in "Chamber's Journal."

NIGHT IN WINTER.

A million twinkling sky-lamps look down through the frosty night:
A million fairy diamonds flash up from the snow so white,
The sharp glint of the frosted steel sounds 'neath the foot below;
And bare brown branches trail their snake-like shadows on the snow.
ELIZABETH WALLING.

THE EUROPEAN GOLDFINCH.

(*Carduelis elegans=Fringilla carduelis.*)

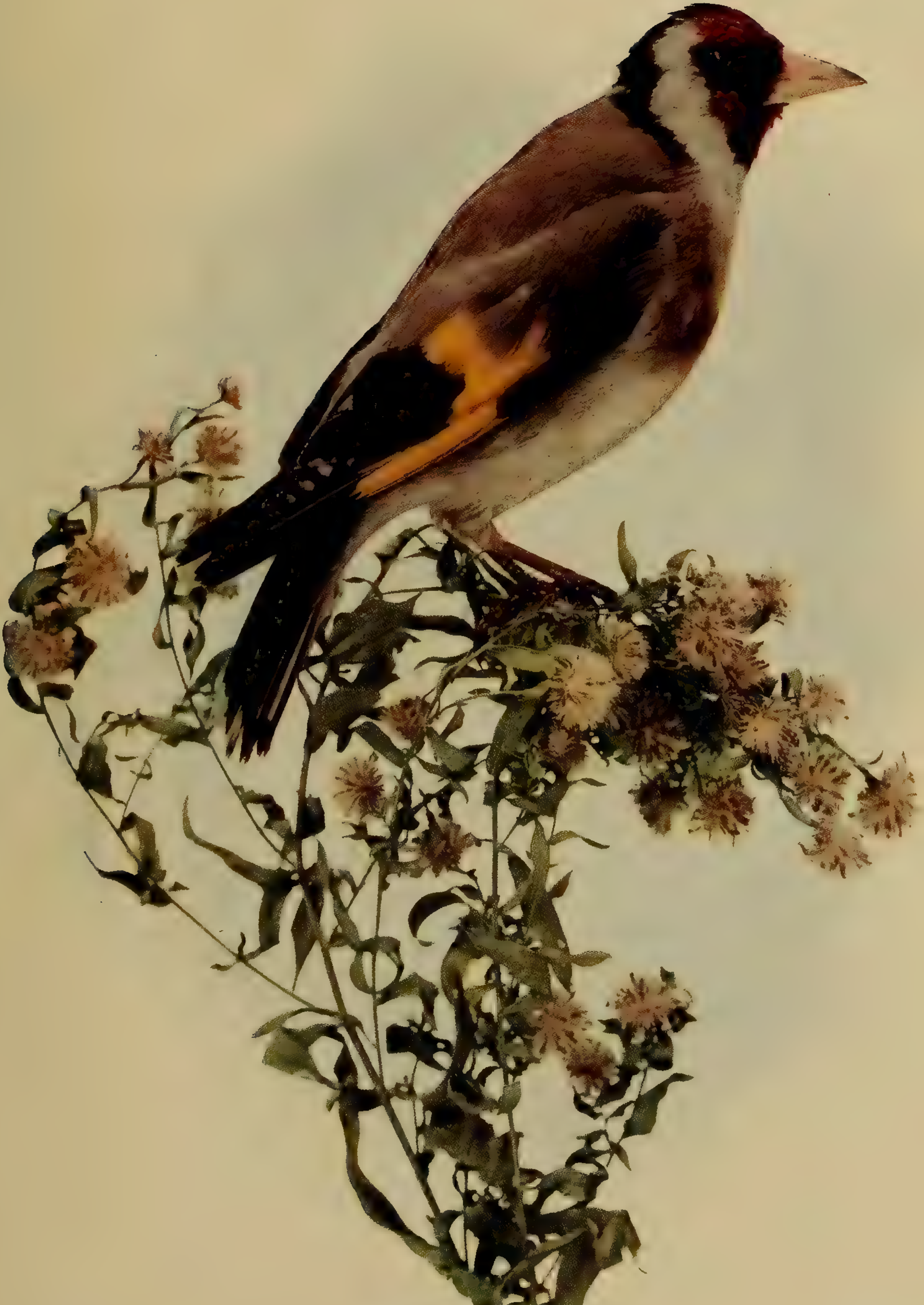
Whose wary flight and cheery whistle
Adorn the wastes o'ergrown with thistle;
No field so foul with noisome weeds
But there the dainty Goldfinch feeds,
And greets with song the fervent rays
That flood high noon of August days.
—Charles C. Abbott, "The Goldfinch."

This gay plumaged and sprightly Goldfinch is a native of the larger part of Europe, northern Africa and eastern Asia. Throughout its range it is a most useful bird, as it feeds extensively on the seeds of weeds, especially those of thistles and related plants. Introduced into various localities in the New England states and New York City, it has seemingly become naturalized. Its nests have been found in Central Park, New York, where they "were placed in pine trees, among the tufts of long pine needles, near the end of a slender horizontal limb and about twelve feet from the ground."

The nests are compact and handsome structures made of fine, soft grasses, small roots and vegetable fibres, mosses and lichens, all woven together with wool and fibers, and finally lined with soft hairs and feathers. These homes have thick walls and are very substantial, and are models of neatness. The materials used vary somewhat with the locality, for the birds never range very far from a favorable feeding ground. Not infrequently the nest is built in deciduous bushes and trees, but a flexible branch of the cone-bearing evergreen kinds is preferred where the nest is gently swayed by the wind and the young are rocked as if in a cradle. Here the baby birds receive their first glimpse of the life that they will live when seeking their own food on the wind-swayed tops of thistles and other plants.

Sometime in March the beautiful male begins to sing. Somewhat crude at first, the song reaches perfection late in May. No matter what he is doing, he finds time to stop and from some perch utter a lovely song. The European Goldfinch is a diligent bird and has an amiable disposition. Except in defense of its young or nest, it seldom enters into combat with other birds.

Many other birds are better songsters, but the docility, the hardy nature, the lively disposition, an apparent attachment for its master and its gay plumage have combined to make this Goldfinch a great favorite among cage birds. When properly cared for, it will sing almost continuously and live much longer than do most of the smaller birds when caged. Its popularity as a pet has, however, greatly reduced the number of these useful birds in Great Britain. An authority states that in 1860, "the average annual captures near Worthing exceeded eleven thousand dozens—nearly all being cockbirds, and a witness before a committee of the House of Commons in 1873 stated that, when a boy, he could take forty dozen in a morning near Brighton." It is gratifying that the capturing of the Goldfinches has not been so extensive in late years. Few birds are more useful to man. The Goldfinch feeds almost entirely upon the seeds of those plants that are equally injurious to both the cultivated field and the pasture. It is seldom found in marshes or in cultivated fields that are free from weeds. It frequents those waste places where there are thistles and related plants and weeds of the mustard family. Nearly all of these plants are most noxious to the agriculturist and several possess winged seeds that are easily transported by the winds. It is here that the Goldfinch feeds most assiduously and the number of seeds that a single bird will devour in a season is far beyond computation. It is an interesting sight to watch the Goldfinch as it leaves its perch in order to catch a seed as it is borne away by the wind.



FROM COL. CHI. ACAD. SCIENCES

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EUROPEAN GOLDFINCH.
(Fringilla carduelis.)
Life-size

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In color the female of the European Goldfinch is very similar to the male except that the tints are less brilliant. Except that the color is less bright during the winter season the plumage changes but little during the year. The period of greatest brilliancy is attained when the male is in full song. This period lasts the larger part of the year, for very often three broods are raised during a single season.

WINTER DINNERS.

"What shall we eat?" may seem to be a serious question with our winter birds. But the "heavenly Father feedeth them" and it is only when the coldest winds blow or when snow, sleet or freezing rain covers the woods and fields that some of them come begging and stealing of your substance.

Then leave your gun idle in the corner, except in the case of the English sparrow. You may find that he is good to eat. In your efforts to rid the bird world of a pest, be sure that you kill only English sparrows and harm none of our own sons of the soil.

Now, during these cold and stormy days when the snow creaks beneath your step, is the season to get a chunk of suet from the butcher, and, taking hammer and nails, securely fasten it to a tree or post as a good-will offering for the birds. If there are cats about, it is better to take a light wire and hang it from the limb of a tree. I say "during the cold and stormy days," for it will be in vain that you proffer your aid when the sun shines warm and the water flows, for the kindly-offered meat will probably receive but a few passing pecks.

One winter day I found a small patch of the snow dust, which covered the frozen crust, all marked with innumerable tracks. Some sparrows had probably picked their dinner from its supporting nail. Nothing daunted, however, others had seized it and it would be interesting to know how many birds it took to make so many tracks. The marked space was about two feet in diameter.

Though the sparrows will eat all the sunflower seed off the stalks in the fall, they will take rice instead in the winter. One winter I procured rice at the grocery and mixed it in a pan with sunflower seed. I fastened the pan among the dead vines on the fence. The birds came and ate. They ate greedily but they ate only the rice. The other seed was left there for days, and in cold weather. At last I threw it away. It seems strange that they refuse this seed in the winter, when food is scarce, and eat it in the autumn when food is plenty. Perhaps some professor will analyze the sunflower seed and tell us why it is not fit for a winter food.

An apple that has wintered on the tree and passed through one of February's freezing rains is about the hardest fruit I know, not excepting a green apple. Its dark brown skin, giving the impression that it is rotten, is covered with a thin transparent enamel put there by the rain and frost. When brought in contact with each other or some hard substance, they respond with an almost metallic ring. Who would think that any creature would eat them? Yet, on one of those very ice-coated February days, I have seen the downy woodpecker picking away at the apples and at least giving the impression that he was eating. It is a mistake to think that all the robins leave us in the fall. I have noticed a robin picking away at an apple in February. I believe, however, that the weather was more clement and the apples were without their armor.

Though, of course, the quarrelsome English sparrow gets more than his share of the food put in a city back yard, nevertheless, I saw a downy woodpecker at the suet twice last winter and he surely would have come oftener if he had not been driven away by the sparrows.

Irwin G. Priest.

THE STORY OF A GREY DOG.

Toto was the totally inadequate name of a beautiful, English greyhound. His family and friends alike felt that this somewhat weak cognomen was quite inappropriate for a dog of undeniably high degree, but the decree of Fate had been stern in this regard. Had a stranger chanced to find the silver-studded, leather collar, bearing the simple legend, "Toto, No. 1 Pelham Road," he never would have guessed that "Toto" represented a tall, English greyhound with a spotless white shirt-front, white paws, and a tiny white tip on the end of his tail. He would probably have fitted the leathern collar about the stout, rough-haired neck of some fussy, little terrier, never suspecting the existence of the slender, silky, grey neck of its real owner.

No. 1 Pelham Road had rescued Toto from the grimy hands of a peddler who obviously had no right to possess him. The peddler had arrived one morning on a bright, red cart, profusely garnished with shining, household utensils, at the rear of which splendor followed Toto ignominiously tethered by a stout cord.

Squire Pelham, the owner of the big house at the top of Pelham Road, was just entering his carriage when the peddler's vehicle turned in at his gateway. Struck by the animal's beauty and evident lack of harmony with his surroundings, the Squire purchased him for a few dollars under the obviously dishonest name of "Fido." Toto at once took kindly to the change in his circumstances, although he steadfastly refused to answer to the call of "Fido." The Squire and his wife and their fourteen-year-old daughter, Marjory, exerted their imagination in vain. No possible dog-name occurred to them which seemed to have belonged to Toto, until one day Marjory, by a happy fluke, called him Toto. Instantly the dog lifted his long, sharp nose in the air, and gave a series of delighted barks, which said as plainly as a dog might:

"Thank Heaven, you have discovered my identity at last!"

Toto settled down very contentedly in his new, comfortable quarters, apparently never wasting a thought on the vanished peddler and his spruce, red wagon. There were keener joys here in these spacious lawns where a dog could run miles without ever losing his home. There was a nice little kennel next the carriage-house, carpeted with sweet-smelling hay, which William, the gardener, freshened up every morning. Then there was a certain spot near the kitchen where two big, white dishes held an unfailing supply of water and bones. Never once had he made useless excursions to these storehouses. Their supply seemed as unfailing as the kind words and gentle caresses he always found waiting for him at the big house where the family lived.

But Toto had dim, unpleasant recollections of a time when bones were scarce and kicks plentiful. It was a long time ago when he had first cut loose from his mother and brothers, and started out in search of adventure. Dreadful little boys had pursued him, and thrown stones at him, in order to see those fleet, grey legs fly over the ground, and shortly after this episode had occurred his ignominious capture by the peddler. Day after day he had followed that hideous, red cart, with its jangling wares, homesick to run about the sweet, green fields, instead of pattering along the dusty, hot turnpike.

And now his former rich inheritance of luxurious comfort had returned to him, mysteriously disassociated with his mother and brothers. However, the loss of his immediate family worried him but slightly, although he had searched conscientiously for them all over the Pelham estate. Very few things had power to worry him now; what could possibly worry a person sure of bones and bed, especially when those bones were more often than not delicate chicken bones, and the bed a big hay affair thoroughly protected by an airy kennel? He rolled on the short, sweet grass, and stretched out all his long, slender, grey legs skyward in a rapture of content. He was still rolling and stretching when he heard Marjory enter the carriage-house and take out her bicycle. Instantly he reversed himself, and took his lithe, grey body joyously across the lawn. He leaped up, barking, to lick her face, begging in his eloquent, dumb, dog-fashion, to be taken out, too.

The little girl bent down to give him a hug, and all her hanging, yellow hair fell down softly about the dog's neck.

"If you'll promise to be good, Toto, and not get lost, I'll take you with me," she said.

Toto understood thoroughly, and wagged innumerable promises with his tail. Marjory mounted her wheel with the wonderful dexterity of childhood, Toto leaping and barking beside her, and the pretty pair raced down the driveway together.

They turned out of the stone gateway into the wide world with a mad sense of liberty in their souls. Toto, being a dog, felt his freedom more keenly, and gave himself up to it more unrestrainedly, but both he and his charming little mistress were in perfect accord. They both liked wild races along the level roads; they both loved the June sunshine, and the delightful emancipation from mothers.

Down the wide, elm-shaded village street the mad pair raced, full of the joy of mere living; along the quiet river-path far out into the country. Suddenly Toto paused. Someone had whistled nearby, and as he stood alert, glancing about, one white paw lifted, a man in blue overalls burst out of the wayside bushes. He certainly seemed an unpleasant character, although his actions were friendly. He held a bit of bread invitingly out to Toto, who saw no reason why he should not accept the proffered hospitality. This was his one fatally weak point. Never could he bring himself to refuse anything to eat. The one bone too much had never been able to cure him of this habit, although it had widened his experience.

For the moment that alluring piece of bread became Toto's greatest ambition. He forgot his dislike of suspicious characters, and, advancing gracefully on his slender, grey legs, accepted the olive branch. Directly his strong, white teeth closed upon the bread, the world turned suddenly dark. He felt himself picked up and carried away rapidly, while a stifling, black cloth was wound tightly about his head.

Then the realization of the loss of his birthright for a mess of pottage overcame his composure, and he struggled frantically in his captor's unyielding arms, howling dismally.

When he regained his liberty he found himself in a narrow, dark shed, which smelt musty. He heard the noise of chickens nearby, and smelt the peculiar odor of cattle.

Suddenly he realized that his beautiful, broad, silver-studded collar was gone, and about his tender neck was a coarse, prickly rope, which was fastened to a nail in the corner. Toto felt at once that this was an unendurable state of affairs. For a moment a wave of homesickness swept over him as he thought of his soft, fragrant hay-bed at home, of those dear, never-failing, juicy bones, of all the love and kindness showered upon him by the family * * * then a grim determination crept into his soul. He resolved to regain his liberty, or die in the attempt.

The first step was to fix those strong, white teeth of his in the solid, twisted rope. It certainly was a tedious, dragging business, but at last he managed to saw his tether apart, and he was a free dog again. He went cautiously about the narrow, dark shed, smelling carefully. He had an instinct that it would never do to bark as he did at home when he wished William to open the door. He knew that he was in the power of a crafty enemy, and that it behooved him to exercise even greater craft himself, so he went softly on velvet paws. Ah, here was the door. Instinctively he crept back into the deeper shadows of the darkness, and waited with an infinite patience.

Centuries went by, then there came a stealthy unlocking of the rude door, and the man in the blue overalls peered into the gloom of the shed. Toto scarcely dared to breathe. The man in overalls came in, leaving the door partially opened. Then Toto with a magnificent leap cleared the entrance with his four long legs, and started in a steady, swinging gallop across the dewy meadows homeward. He heard voices calling after him, and experienced a proud, triumphant joy that his freedom was again his own, and that he could maintain it.

It was a long way home, and he was hungry and thirsty, but he never paused in his long, swinging pace. Hedges and stone fences were as nothing in his path. He leaped them without a quiver of his long, lithe body. It certainly was a long way home, and he had suffered untold misery during those wretched dark centuries in the shed, but at last the dear, familiar stone gateway came in sight, and in a moment he was trotting up the long, graveled driveway.

It was very early, but they were all there to greet him—the family who had been good to him, and whom he loved, yes, better than even bones. He knew this when he found himself confronted by a choice between them and his two little, well-filled, white dishes. He wagged a tired tail to assure them that his heart had remained unchanged during his long absence. The Squire came quickly down the steps, and cut the harsh, broken cord about his neck.

"Poor old chap," he said, "you've begun to pay the penalty of belonging to a rich master. I rather think your liberty would have been safer with the peddler."

Marjory ran down the steps to meet him. There were tears in her pretty, childish eyes, as she hugged him closely to her.

"You naughty Toto," she said, half-laughing, half-crying. "You promised me not to run away, and then you went and did."

Toto barked his regrets and apologies and tried to express with his eloquent, white-tipped tail all that he had suffered during his exile. The Squire regarded him attentively, seeming to understand the elaborate explanation of tongue and tail and pathetic, brown eyes. He patted Toto's smooth, grey head.

"Never mind, old chap," he remarked, "I think I can find the owner of this rope, and when we find him we shall have our revenge."

And Toto wagged his tail understandingly.

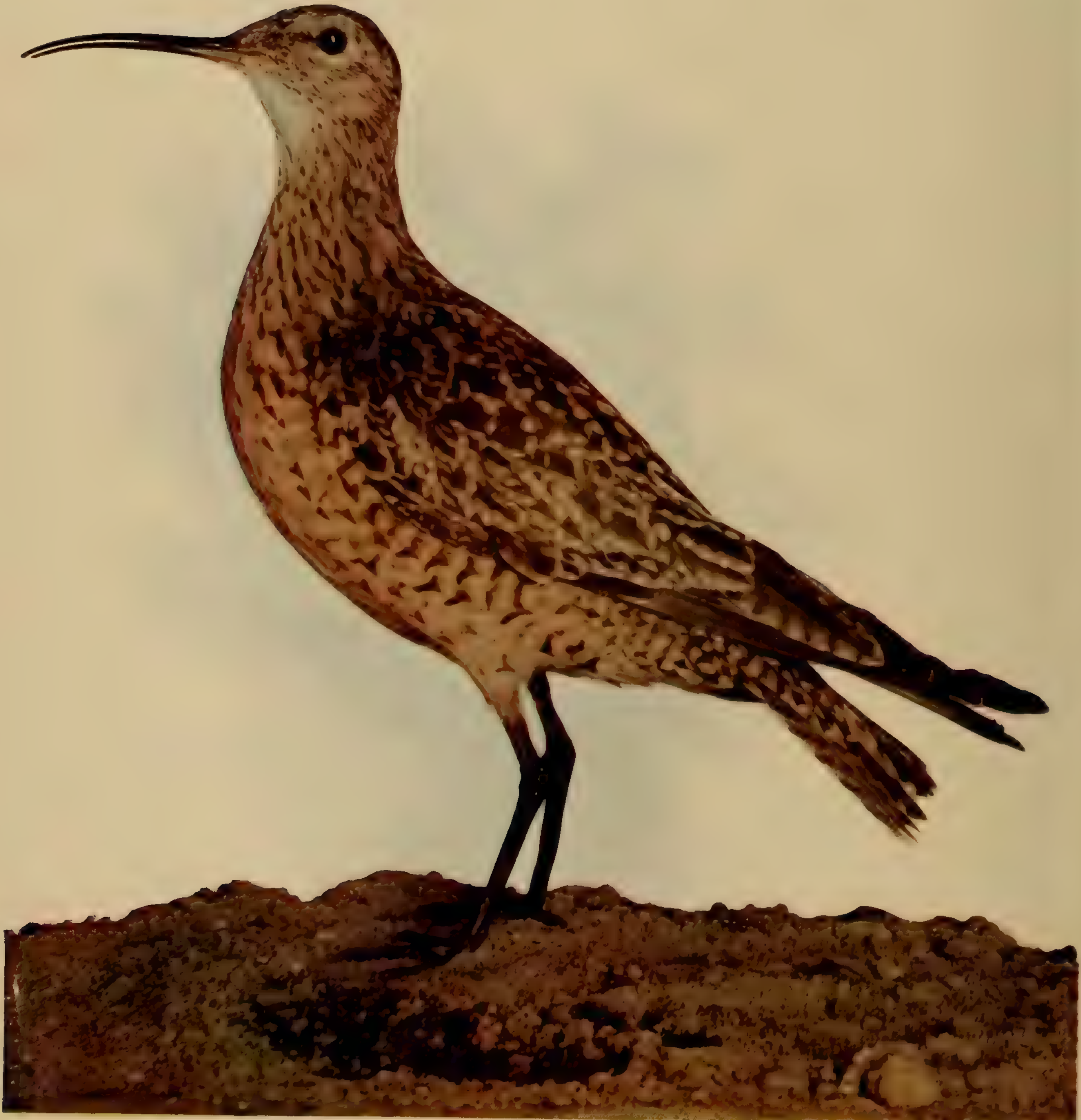
SARA BULKLEY ROGERS.

A BRAVE LITTLE MOTHER-MOUSE.

When we moved into our summer cottage (which, of course, had been tightly closed since the previous September), and opened a folding bed, we discovered a mouse's nest between the ticks and four baby mice and their mother comfortably at home in it. One of my brothers grabbed a broom and the other a hammer and started on the warpath at once. To their great surprise the old mouse would not budge, although she could easily have escaped. Instead, she hovered over all until she realized that she could not save four; then she grabbed one by the back of the neck, as a cat does her kitten, and started to run with it.

It was a most pathetic little effort and showed that even mice are as brave and affectionate as any of us.

LEE McCRAE.



FROM COL. CHI. ACAD. SCIENCES.

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ESKIMO CURLEW.
(Numenius borealis).
About ½ Life-size.

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THE ESKIMO CURLEW.

(*Numenius borealis.*)

The Eskimo Curlew, or Dough bird, as it is frequently called, has an extensive range covering the entire length of eastern North America. In the United States, it is known only as a migrant, for it seldom winters within its borders, but passes southward into Central America and throughout South America. As it nests within the Arctic circle it is seldom seen south of the Canadian border during the summer months. The northward migration takes place during the last of April and early in May; the southward begins about the first of September. Its favorite feeding hours are at the beginning and at the close of day, and during its migrations it frequents grassy marshes and neighboring fields where it finds a plentiful supply of insects, earth worms and mollusks. When the Curlews leave their migration feeding grounds in the United States for their nesting localities in the far north, they present a unique appearance as they gather for the journey. Mr. Wilson graphically describes their preparation and flight. He says, "Their appearance on these occasions is very interesting. They collect together from the marshes as if by premediated design, rise to a great height in the air, usually about an hour before sunset, and forming in one vast line, keep up a constant whistling on their way to the north as if conversing with one another to render the journey more agreeable. Their flight is then more slow and regular so that the feeblest may keep up with the line of march, while the glittering of their beautifully speckled wings, sparkling in the sun, produces altogether a very pleasing spectacle." Mr. Nuttall says: "They are remarkably gregarious, each company seeming to follow some temporary leader, and on starting to fly, a sort of watch-cry is heard, resembling the whistling pronunciation of the word bee-bee."

While in the North the Curlew's food consists to a great extent of berries, especially the small deep purple berry called the bear or curlew berry. Dr. Coues says that it feeds so extensively upon this berry that the intestine and the "legs, bill, throat and even the plumage are more or less stained with the purple juice." These berries are so abundant that the Curlew becomes exceedingly fat and forms a dainty morsel for the table of the epicure.

The little Curlew, as the Eskimo Curlew, is sometimes designated, very closely resembles the short-billed curlew in the markings of its plumage, but its much smaller size is a ready means of distinguishing it. It also frequents fields more commonly than the short-billed species. Not infrequently it is found in company with the golden plover during its migrations through the interior of the United States.

In its habits the Curlew quite closely resembles the plover. Mr. Mackay says that "in migration they fly in much the same manner, with extended and broadside and triangular lines and clusters similar to those of ducks and geese at such times. They usually fly low after landing, sweeping slowly over the ground, apparently looking it over, generally standing motionless for quite a while after alighting, which, owing to their general color approximating so closely to the withered grass, renders it difficult at times to perceive them."

AT THE SIGN OF THE POINTED GABLE.

The similarity of our circumstances first drew me toward him; we both were young, enthusiastic and poverty-stricken, and both of us became householders on the same day beneath the same roof. It was a beautiful day in early May, and the roof which was to shelter us hid our mutual gable deep in the perfumed boughs of an old apple tree. The gable faced the western sky, and it was just as the sun was setting in a glory of golden lights behind the apple blossoms, that I paused in my labor of settling the simple furniture of my attic, and suddenly discovered my neighbor.

He was perched upon the broad ledge of the window regarding me suspiciously, with as much distrust of me written all over his plump, little figure as was possible to an ordinary English sparrow. A long, tell-tale string hung from his blunt, yellow bill, and I knew directly that we had similar tastes. We both loved the old pointed gable hidden away among the apple boughs, fronting the west.

I was settled first, but then I had the unfair advantage of a ready-made home with ready-made furnishings. My little neighbor had staked out his claim merely, and his nest was still a problem. Day by day the skillful little builder industriously brought up to the gable a curious collection of odds and ends until an impressive, brown edifice reared itself in the safe solitude behind the shutter.

Early one morning as I was on my way down to the bank—perhaps I ought to confess that I am only a modest clerk with a small salary—I noticed a trim nursery maid wheeling along a cart in which sat a child busily engaged in dressing a doll quite as big as herself. As I passed them a long, narrow blue ribbon with a pattern of tiny rosebuds running daintily through the middle of it, fluttered away in the light wind and nestled against my coat. The child reached out her hands for it with the unquestioning faith of childhood, and I restored it to her and passed on, forgetting the incident until one afternoon when my little neighbor having flown away on a business errand, I seized the opportunity afforded by his absence to inspect his new home.

Greatly to my surprise, deftly woven in and out of the cunningly-wrought feathers and straw and string, was the dainty, rose-sprinkled, blue ribbon which I had last seen in its baby owner's hands.

"The little rascal has the artistic temperament," I reflected, admiringly, and then withdrew hastily for he was flying swiftly homeward over the neighboring roofs.

Our maners and customs I soon found were very much alike, and this fact drew us still closer together. We both spent our days in the uninteresting routine of working for our daily bread, although I suspect his business methods were far less monotonous than mine at the bank. However, at four o'clock we both were ready to throw aside business worries, and show our natural inclinations. We both agreed in liking to stand at the window and watch the sunsets behind the old apple tree; that is, my neighbor always perched upon the very tip of the pointed gable, and told the ancient world his opinion of all its wonder and beauty. He often made it very clear that he was singing his gratitude for benefits bestowed upon him, and having poured forth his soul in sheer joy of living, he would retire into the softness and silence of his snug, little house, and tuck his head under his wing for the night.

I feel certain that no one listened to his ecstatic evensong except me, and for this reason I felt a deeper, more subtle sympathy with him. I, too, had tried to express my grateful appreciation of all the loveliness about me in occasional poems, which in rare moments of courage I had sent to sundry magazine editors. Alas! they all had come back to me with an unfailing regularity, but cheered by my tiny neighbor's example, I wrote on as he sang on—for the mere joy of it.

I was writing on late one Saturday evening when I heard a faint cry of distress, and a frightened fluttering of wings. I went to the gable, and looked out. The wide horizon of ugly roofs and chimney-pots lay softened and picturesque in the bright moonlight. There was nothing visible which might explain the terror of my little neighbor behind the shutter. I went back to my desk, and again I heard the frightened fluttering of wings and the tiny cry for help.

Fetching my candle I carefully examined the nest. I saw the round, brown head and bright eyes regarding me imploringlv and I could think of nothing better than to loosen the shutter a bit while I braced the mass of straw and feathers carefully against the side of the house, in order that all that intricate labour of its architecture might not be wasted. The heavy shutter swung out into the night, and suddenly the bird spread his wings and attempted to fly away. He fell down against the house, and in the clear moonlight I saw that his feet had become inextricably entangled in the long, blue, rose-sprinkled ribbon which he had stolen to grace his home.

He lay quiescent in my hand, a soft little ball of fluff, after I had pulled him up from his perilous position. He seemed to divine my desire to help him, and to trust me. Even after I had cut the ribbon from his slender legs, he remained peacefully resting in the hollow of my hand.

"The way of the transgressor is always hard," I said to him, severely. "Now, if you had not stolen that child's ribbon you would not have got yourself into this pickle. It certainly ought to teach you a lesson."

But evidently this was not the kind of comfort that he expected, for before I could finish giving him all the good advice I intended, he had poised himself delicately on his little, gray wings, and flown out of the window, into the beautiful, moonlit night.

Sara Bulkley Rogers.

THE SILVER POPLAR.

Have you not marked the poplar in the wind
Change in a moment, its plain robe of green,
For one of mingled pearl and moonlight sheen,—
By sudden stress of some wide-wandering breeze,
Made loveliest of all the roadside trees?

And men there are, akin to this same tree—
We scarcely note them as we come and go;
But ah, when gales of Joy or Sorrow blow,
Transfigured they stand forth, so dear, so kind,—
Have you not marked the poplar in the wind?

—Lulu Whedon Mitchell.

THE SAVANNA SPARROW.

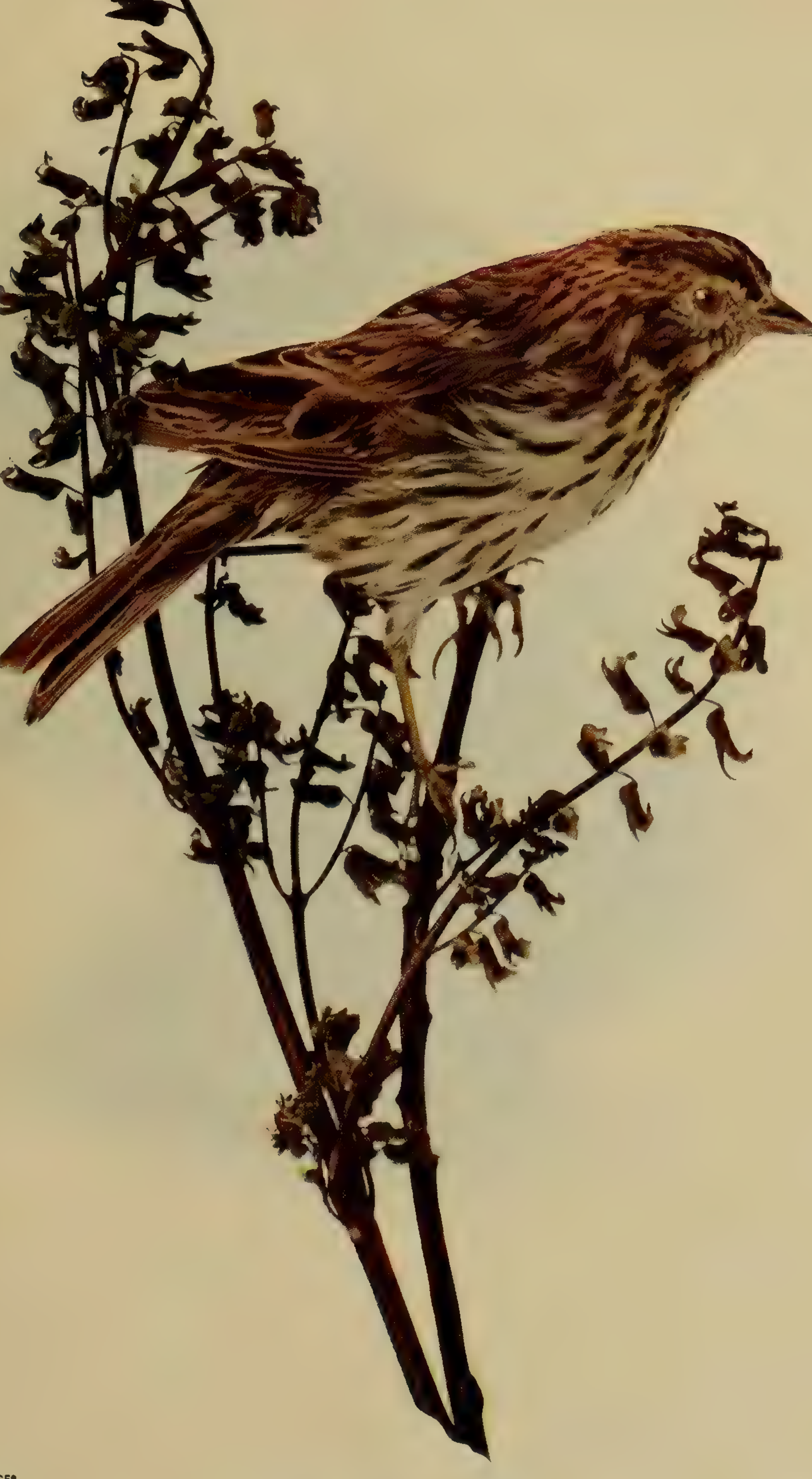
(*Ammodramus sandwichensis savanna.*)

"The Savanna Sparrow is one of those inconspicuous little birds which hide in the grass or run stealthily along the fences or furrows, having nothing special in their appearance or habits to attract particular attention." These are the words of Dr. Robert Ridgway, regarding this retiring but useful little bird. In its habits it very closely resembles its relative, the vesper sparrow. Both frequent meadows and nest on the ground. Not infrequently, when walking through a meadow, one will be startled by the sudden whirr of wings as one of these sparrows flies away from a spot almost beneath his feet. Its habits are decidedly terrestrial, and it is not infrequently called the Ground Sparrow.

The Savanna Sparrow is an abundant species throughout the eastern portion of North America, breeding in the northern United States and Canada and wintering in the southern states, Mexico and the adjacent islands. Near the Atlantic coast, where it is a common resident, its favorite feeding grounds are the salt marshes. Here its food consists of small mollusks as well as of insects and grass seeds. Dr. Sylvester D. Judd, who has made a careful study of the sparrow and their foods, with special reference to their effect on agriculture, considers the Savanna Sparrow an exceedingly valuable bird. "During the winter, when it is most granivorous, more than half of its food consists of weed seeds, and from May to August, when it is most insectivorous, beneficial insects form only three per cent. of the food, while insects of the injurious class amount to forty-five per cent."

The nest of the Savanna Sparrow is constructed on the ground in hollows under the protecting shade of a tussock of grass or a clump of weeds. The materials used in building this simple home are usually grasses and fine roots or moss neatly twined together and lined with very fine grass and hair. Not infrequently two broods are raised in a season.

Its song is not easily described. During the mating season some listeners consider the song of the male, which he utters in the morning and at the close of day, quite pretty, though of little volume. Mr. Oliver Davie says: "Its song is weak, squeaky and unmusical, which at times is uttered from the ground or from the tops of bushes." Mr. J. Dwight says: "The song is insignificant—a weak, musical little trill following a grasshopper-like introduction, is of such small volume that it can be heard but a few rods. It usually resembles tsip-tsip-tsip-se-e-e-s'r-r-r. More singing is heard toward sunset, when of a quiet evening the trills are audible at greater distances." Dr. Coues considered the nuptial song quite sweet and simple and says that at other times the only note is a weak chirp. "It has the sharp chipping note of its family," writes Mr. Langille, "but its song is strongly marked and may be represented by the notes zip-zip-zip-zwree-e-e-e-e-e, zwree, the first three being short, subdued and uttered in quick succession, while the fourth is louder and drawn out into a sort of trill or twitter on the upward slide, and the latter is much shorter and with the falling inflection. The song is not loud and has but little variation, but is one of those gentle, drowsy sounds in nature which are decidedly soothing."



FROM COL. CHI. ACAD. SCIENCES.

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SAVANNA SPARROW.
(Ammodramus sandwichensis savanna).
Life-size.

THE RED-TAILED BUMBLE-BEE'S NEST.

(*Bombus juxtus.*)

In the Rocky Mountains bumble bees are very abundant, especially in the high canons and tablelands. Indeed, you may go up until almost all other wild bees disappear and still the alpine flowers will be visited by hundreds of bumble bees.

In the beautiful Lapello canon there are hundreds of wild bees, so many that it would take several pages to print only their names, and among them are a half dozen species of the bumblebees. The Red-Tailed Bumble is one of the prettiest as well as one of the most abundant. The ones commonly seen at work on the flowers are workers. They are about as long as a good-sized honey bee, but much stouter. The body is black and almost all covered with fuzzy lemon yellow hair, except near the abdomen tip, where there is a patch of red hair.

Not long ago I had the good fortune to find the nest of this bumblebee. It was an irregular half sphere, covered with bits of old rope and the tough fibre from plants, and measured about six inches in diameter. The back of the nest was glued to a log, and at each side there were two entrances and through them the workers hurried in and out with a puffing buzz and when starting seemed to say, Off for a hard job, off for a hard job! They all returned well loaded with pollen and honey. The pollen baskets on their legs almost overflowing with green, yellow or orange pollen.

At last my desire to know what was going on inside the nest conquered, and one rainy day when all the bees were in their nest, I played the robber and thief and raided the small community.

Under the coarse covering was a finer one made from the same material, and just under this covering and glued to it was a sticky layer made from the gum of plants and trees. This gum formed a domed shaped roof and a floor for the nest. The cells were built up from the floor, and arranged in groups so as to allow the bees to pass among them; a space was left all around the cells, apparently for the same purpose. The nest was full of bees and cells, and very neat, differing much from the dirty, poorly constructed nests of other species of bumblebees. I counted thirty small bees, workers and males, and there were two queen mothers.

The queens were fine looking creatures, colored like the workers and like them, covered with soft lemon yellow hair on face, thorax and first two segments of the abdomen. The tip of the abdomen was black and between the black and yellow surface was the characteristic patch of red hair. The queens were nearly an inch and a half in length, but slender, and very graceful in flight, quite different from the stout, awkward queen mothers of the other species of bumblebees that I have seen.

The nest was well stocked with honey; about twenty cells, which looked something like six grain capsules, made of the same gum as the roof and floor, were uncovered among the broad cells. The brood cells were of various sizes and all covered. When these cells were opened the tiny worm like larva or the white, soft bee like pupa were seen.

In some of the cells were white worm creatures which never came from bees' eggs, and in looking about I found the parents feasting on the stores of the bumblebee while it left its young to eat the food provided for the young bee, or even to eat the bee larva itself. The first of the bees' visitors that I secured was a small brown beetle, irregularly spotted with yellow. Next came a little beetle, hurrying about among the cells and matching them in color. Examined under a lens the head and thorax were a clear yellow, and the wing covers shone like dull gold. A pretty visitor, but an unwelcome one, I fear! Then there were two other species of beetles, both small and brown, but one distinguished by short wing covers.

Besides the beetles there were innumerable ants purloining sweets, the larva of a bee moth, and hundreds of tiny yellow spiders.

There is an enemy that these creatures have that I did not find in this nest, but probably if I kept all the sealed cells from some of them would emerge cuckoo bees —bees that never provide for their own young, but put their eggs in the cells prepared by other bees.

What a nuisance these pests must be to the bumblebees! At times they must feel like giving up housekeeping.

Fortunately there is a new nest every year, for only the queen mother lives there in the winter and at the beginning of summer she crawls out from under the stone or log where she has been hiding all winter, and starts a new nest. So soon as she has a little pollen gathered she lays some eggs, and it is not long before she again has a household to work for her.

Wilmatte Porter Cockerell.

THE SEER AND THE BIRD.

A wise man sat in a garden
  Where the breezes gently stirred,
And while he mused of his power,
  A wee little yellow bird
Fell a-fluttering down with a broken wing,
In the midst of a song he'd begun to sing.

The wise man sought in the grasses
  And lifted the songster out,
He held it close in his fingers,
  And spoke in a tone of doubt,
"What a quivering atom of life," he said,
"The stroke of my hand and I'd leave it dead!"

The birdling trembled a moment,
  Then out from its tiny throat,
Which throbbed with inward longing,
  Came a low, sweet plaintive note.
Then the threatening hand was drawn away,
And the wise seer's soul voice seemed to say:

"Ay, power of brawn is mighty,
  But another, greater still,
Can make of a man a weakling,
  Can take from a man his will.
For the strength of arm is of no avail,
When Mercy is shield of the weak and frail."

Jac Lowell.

THE MUSHROOM ANTS.

In Africa and other tropical countries there is a remarkably interesting species of the termite, or white ant, called the Mushroom Ant, from the fact that its nests resemble gigantic mushrooms. These nests, which cover the prairies surrounding the great forests, are formed of a clayey material, predigested in the ant's body, and are so constructed that neither light, air nor rain can penetrate their walls. Each structure is the home of a colony, and, as the individuals increase in number, two, and often three, crowns, one upon the other, surmount a single column. As the increase continues, and the danger of top heaviness becomes imminent, the colony divides into two, and a new home is begun nearby.

As this species multiplies with almost incredible rapidity, its nests number thousands and the prairie, on the authority of eye witnesses, presents a unique and wonderful spectacle. Each colony includes three kinds of ants. First in rank are the chiefs. They are few in number. They have large bodies and heads armed with powerful nippers. Next in rank are the officers, or overseers, and the fighters. These are somewhat smaller, though they boast the same powerful nippers. Lastly there are the workers, the most numerous class in the community. Their bodies are comparatively small, and their nippers short.

When about to build, the following ingenious and interesting method is pursued. The dry season is chosen and a time when there is no sun. Old Sol is a deadly foe to this species of the insect family. The chiefs give their orders to the overseers, and these in turn transmit them to the workers. The first step is the hollowing out of deep perpendicular tunnels, reaching down to the blue clay, which is the basis of their building material. The next is the making of similar tunnels, reaching upward. These tunnels are the highways, along which travel a never ceasing stream of workers, to and from their field of supply. The clay is eaten, transformed during the digestive process into a gluey substance, and ejected from their bodies in large quantities. The loads are put side by side, with all the skill and precision of an expert bricklayer. An officer overlooks the work of this well drilled army, in which, apparently, there is not one lazy individual. Occasionally an ant brings grains of sand and deposits them in the mortar. The structure rises as if by enchantment. First the column, usually five inches in diameter, then the crown, with its numerous cells communicating with each other. A large cell, reserved for the queen, has an entrance at each end. The tunnels are lined with a gluey substance ejected from the worker's body. This is to prevent their giving way. At the base of the column, inside, is a round clay ball, divided into three parts. Here are the very small cells where the eggs are to be deposited. This ball communicates with the other part of the building by tunnels, through which the eggs can be transferred to the various cells.

When all is complete the household is arranged. Officers are scattered over the building in order that they may more conveniently watch the cells. A special guard is provided for the queen. The queen's life is devoted to laying eggs. This duty she does thoroughly. The heat hatches her enormous production and the tiny ants, milky white in color, are removed to other cells and carefully tended by the workers.

A colony, like the above, may go on without mishap for a long period of time, but often an accident happens. It may be the foot of an animal, the falling branch of a tree, or some other cause, but a crash is heard and a portion, at least, of their home is in ruins.

Immediately officers appear at the openings of tunnels, and the damage is reported to the chiefs. Soon after overseers station themselves at all the breaks with nippers open. Orders are given and the work of rescue begins. The wounded that are past hope are left to die. Those less seriously hurt are gently lifted between the nippers of the rescuer and carried inside. Those who can hop or creep about are led, and the young are carried with the utmost care. When this work is finished repairing begins. Officers make tracings with the points of their nippers and the workers, after removing the debris, bring the material and arrange it as was done in the original building.

Sometimes a furious battle is the outcome of one of these accidents. The cause is another species of white ant, a very lazy species, which lives upon the labor of others. These ants are small, mere pigmies as compared with their cousins. They are extremely cunning, however. Their community is also divided into chiefs, officers and workers. When they wish to establish themselves in the home of the Mushroom Ants their first step is to dig with their nippers through the thick walls at the bottom of the structure. Every particle of debris is carried away and deposited in the earth. They then construct their small cells and tunnels between the original large ones, showing a most remarkable intelligence in avoiding too dangerous proximity. When finished, these tunnels are coated with a gluey substance, black in color, thus differing from that of their big neighbors, which is yellow. That the large ants could thus live in ignorance of the presence of their unwelcome guests seems almost incredible, yet such is the case. An accident, however, enlightens them. Side by side with their own dead and wounded are the dead and wounded of the pigmies and a furious battle results. Giant against pigmy, but the pigmy is not the less brave. With him it is a fight for life.

The mode of warfare is to disembowel one another by piercing the soft stomach with the powerful nippers. This is the vulnerable part of the body and once pierced, the ant is crippled and dies. The scene of carnage is fearful. No quarter is asked or given. The battle ends only when every pigmy is dead.

Louise Jamison.

THE YEAR.

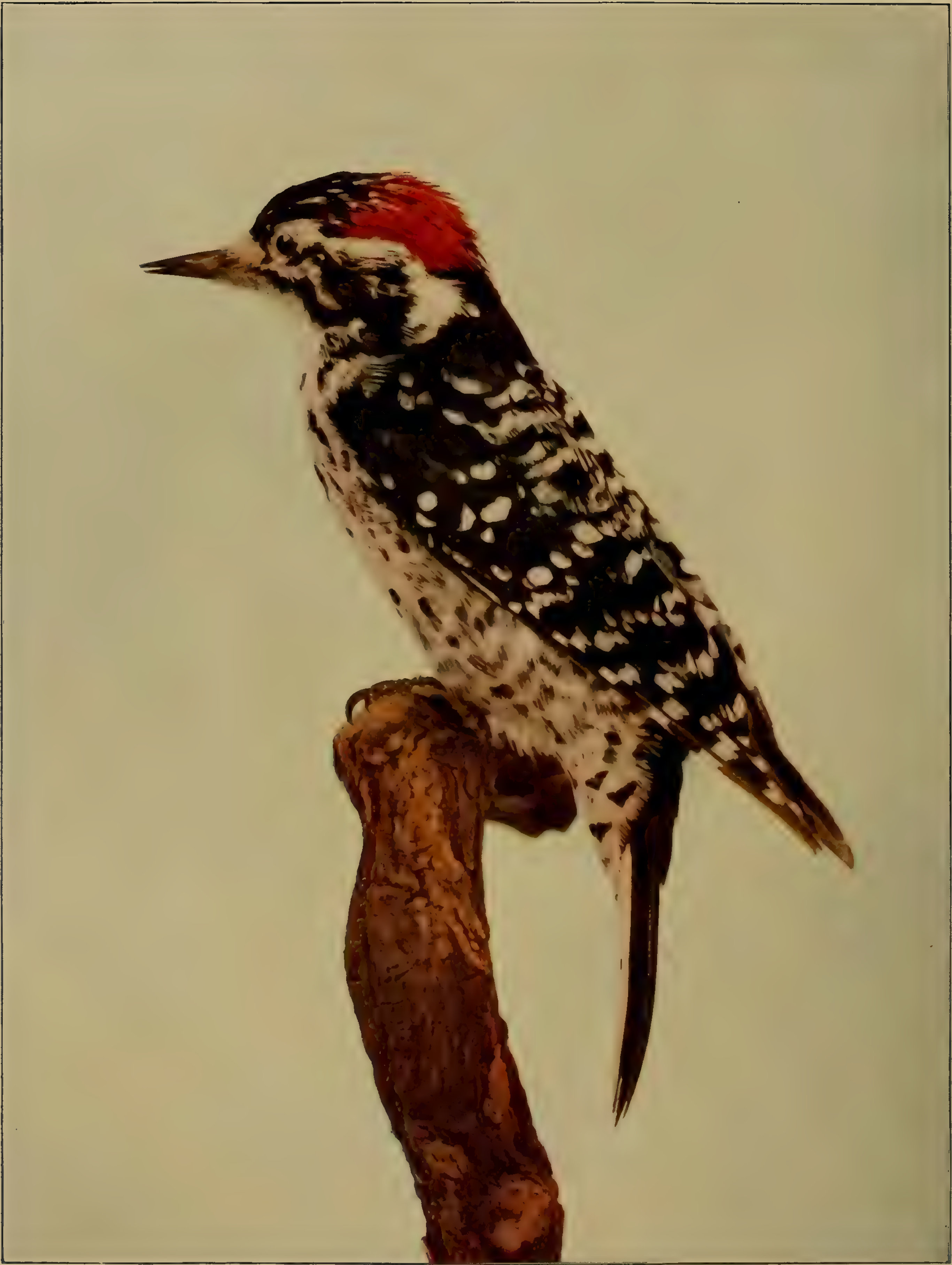
Far off woodlands blue like cobalt,
Nearer forests reddish brown,
Landscape white, white, everywhither,
Winter! Nature's face a-frown.

Tint of green o'erspreads the country,
Tinkle, tankle, roll the rills,
Roar and rush the muddy rivers,
Spring comes romping 'mong the hills.

Roses! buttercups and daisies,
Then the haughty goldenrod;
Summer simmers, town and city
Spill themselves on country sod.

Autumn! glaring, flaring, blaring,
Blaze of glory ending all,
One last mad outburst of splendor—
Then again white winter's pall.

Frank Farrington.



FROM COL. CHI. ACAD. SCIENCES

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NUTTALL'S WOODPECKER.
(Dryobates nuttall.i).
Life-size.

THE NUTTALL'S WOODPECKER.

(*Dryobates nuttallii.*)

The range of Nuttall's Woodpecker is long and narrow. Lying west of the Sierra Nevada and Cascade mountain ranges, it extends from the southern portion of the state of Oregon southward through California into the peninsula of Lower California. It is a denizen of the lower foothills throughout the length of its range. It is partial to the oaks that grow in the vicinity of streams, though it also nests in the old or dead limbs and trunks of cottonwoods, elders, willows and sycamores. As a rule, it avoids coniferous trees. Mr. H. W. Hinshaw says: "This Woodpecker is a bird particularly of the oak groves, and ranges from the lower valleys of the mountains to a height of at least six thousand feet, where, near Fort Tejon, I found it fairly numerous among the pines, this being the only locality where I found it among the conifers." As a rule, however, it is not common above the limits of the oaks or sycamores—a height of about four thousand feet.

Nuttall's Woodpecker not only nests in the dead limbs or stubs of the trees already mentioned, but also in the giant cactus. The nesting hole is seldom more than a few feet above the ground. Both sexes assist in the work of excavating and also in the incubation of the eggs.

Like many other woodpeckers this bird is a devoted parcut, frequently permitting itself to be caught rather than leave its nest when it contains eggs or young. Mr. B. T. Gault records the finding of a nest the opening of which he enlarged sufficiently to permit the entrance of his hand. He was surprised to find the bird—a female Nuttall's Woodpecker—still on the nest. On taking her out "she appeared to be stupefied—dead, apparently—but soon revived." Dr. J. G. Cooper has also taken a female from its nest under similar conditions. Others, too, have recorded like experiences with this bird and it would seem to be a constant characteristic of the species. When frightened from their nest both parents will remain near by and both by voice and action, violently protest against intrusion.

Mrs. Florence Merriam Bailey gives an excellent account of the habits of this Woodpecker in her "Handbook of Birds of the Western United States." She says: "It has a nuthatch-like way of flying up to light on the under side of a limb, and when hanging upside down turns itself around with as much ease as a fly on a ceiling. At times the small Nuttall waxes excited, and shakes his wings as he gives his thin, rattling call. All his notes are thin, and his quee-queep has a sharp quality. His chit-tah is a diminutive of the ja'cob of the California woodpecker. He is a sturdy little fellow and in flight will sometimes rise high in air and fly long and steadily, dipping only slightly over the brush. He has the full strength of his convictions and will drive a big flicker from a sycamore and then stretch up on a branch and call out triumphantly. Two Nuttalls trying to decide whether to fight are an amusing sight. They shake their feathers and scold and dance about as if they were aching to fly at each other, but couldn't quite make up their minds to so grave a matter."

A MINIMIZED IGUANODON.

Among the curious food-stuffs to which we were introduced by the Indians in the Orinoco country and, from almost sheer necessity, compelled to eat, was nothing less than the flesh of a great green lizard, called the iguana. This first introduction to such a novel dish was not enthusiastic, as the idea of making a repast upon a reptile—a lizard—was somewhat repulsive to what we conceived to be our refined taste. Yet almost the first morsel dissipated our aversion as it proved to be beyond doubt one of the choicest delicacies of the tropics. The flesh is a most clean and dainty white and as tender as a spring chicken. The taste, while extremely agreeable and palatable at the very outset, is comparable to nothing else, unless it may be somewhat similar to frog's legs.

We had frequently observed this quaint, horny-backed creature plunging into the streams as we approached and though regaled by our muleteer with many stories as to its superior virtues as an edible, we had awaited the actual pinchings of hunger for fresh meat to receive our initiation. It was the beginning of many subsequent meals upon the iguana, and we afterwards craved it when scarce, and would quadruple the ordinary price in order to secure specimens.

This lizard is both land and aquatic in its habits, subsisting largely upon bulbs and insects, with an occasional appetite for small fish. It is a light green color and, with its armored back somewhat like an alligator, has a rather formidable appearance, but is harmless and easily captured, especially when found in trees whither it goes in search of juicy bulbs, buds and bird's eggs. It is thought to belong to the same family as the giant lizard, to which science has given the name of iguanodon.

ANDREW JAMES MILLER.

THE FARMER AND THE BARN SWALLOWS.

I have read an acount of the kindness to a sitting bird, of Mr. Corliss, the engine builder, how he delayed a part of his work on a contract because it would interfere with her, and how he planned not to frighten her from her nest. Such men are our true noblemen.

I should like to relate something akin to the foregoing, as a tribute to the memory of my father, who was always a friend to our dumb animals.

On my grandfather's farm in Boxford, Massachusetts, were two old-fashioned barns. Among the beams and rafters of these, an innumerable multitude of swallows had their nests every summer. For a good many years my father was the last one to leave the barns at night, and during the nesting time of the swallows he would never close the doors until they had all gone in. To be sure there were little windows which were left open all of the night, but the swalloys flew in and out at the doors, and he feared that they might not go in at the windows, so, no matter how tired after a hard day's work, he always delayed his time for rest until the swallows, as well as the cattle, were all under cover.

I have lived all my life in a farming community and have yet to learn of another farmer who has taken such pains to promote the comfort of the birds.

MARY ELLEN PERLEY.

NESTING OF THE REDHEAD DUCK.

It is the mother bird of this species, and her habits, during the breeding season, that will be described in the following lines, hoping that new information regarding this interesting duck may be furnished to our readers.

To many people the Redhead is known only in a commercial way, as they appear semi-annually in our markets, together with strings of other ducks, which have met with a similar fate. In fact, few sportsmen know them "but to shoot them," and little is known regarding the nesting habits of this water fowl except by those who have had an opportunity to visit our northern marshes, where the thousands of water birds congregate yearly, to lay their eggs and rear their young. In their summer haunts our ducks assume a different aspect. They cease to be the wary creatures they were when migrating through the states from their winter abodes. Those that ran the gauntlet and escaped the hunter's bullet now find peace and comfort in their surroundings where only the most enthusiastic bird-lovers and naturalists venture. Anyone making such a trip will surely find himself abundantly repaid and his research will reveal many traits in the lives of these water fowls which they do not betray during their brief stay with us in their spring and fall migrations.

The female Redheads lack the conspicuous red or rufous of the head and throat, also the black of the upper breast and back. which the male possesses. She is grayish brown above, darkest on the rump and lightest on the head, the throat being white. The under sides are gray, tinged with buff; the belly is white.

Redheads, or American Pochards, as they are frequently called, belong to the genus Aythya, of which there are five American species. These are classed as seaducks, and although the Pochard is found in great numbers on the sea coasts, especially the Atlantic, from October to May, they can not be regarded as our true sea ducks.

Redheads enjoy waddling about in shallow water and frequently feed by "dipping," both habits being characteristic of our river ducks, namely, the mallard, pintail and teal.

The flight of the Pochard is said to be about equal to that of the canvasback or mallard, which is estimated at forty-five miles an hour.

From Maine to California the Redhead has been known to breed, but their principal nesting localities, in this country, extend from northern Michigan westward through Wisconsin, Minnesota, Dakota and Montana. It also breeds abundantly in some sections of Canada, especially in Manitoba.

During a trip to North Dakota in the spring of 1900 I found the Redhead an abundant summer resident throughout the northern part of the state.

They are very aquatic in their nesting habits; more so than any others of their family except the canvasback and ruddy duck, in whose company they are often found during the breeding season.

I discovered fifteen nests during the month of June, all of which were situated in tall grass or reeds growing in water from one-half to two and one-half feet deep. In no instance was the nest placed on the ground. Usually the nests were built in clumps of green grass at the base of which was an accumulation of dead vegetation. The dry grass is massed together, forming a foundation upon which the nest proper, of the same material, but finer quality, is placed. This is securely woven to the living vegetation which surrounds it. Frequently the birds construct a floating nest, and it is a beautiful sight to observe the female slide from her eggs into the water, uttering a subdued quack as she paddles out of sight among the tall grass.

THE DRAGON FLY.

Of all the myriad of insects with which nature has blessed and tormented us there is none more graceful or swift of wing and none that has more nicknames than the Dragon Fly.

He is known as "Snake Feeder," "Snake Doctor," "Devil's Darning Needle," "Horse Stinger" and "Flying Adder." Legend says he is apt to sew up the eyes and ears of bad boys, that he is the favorite doctor of the water snake and stings horses. To me as a boy he was the sure sign that a snake was not far away, and so thoroughly did this groundless superstition get hold of me that yet I instinctively look for a snake when I see a dragon fly.

There are many species of this order of insects, more than two thousand having been described. The United States has about three hundred kinds of these and some two hundred and twenty-five are peculiar to this country. It is claimed that Ohio and Indiana have each more than one hundred species.

For the amateur collector there is nothing excepting the butterfly that makes so attractive a display. The dragon fly is common everywhere and is everywhere a favorite specimen. He is not always easily caught and considerable patience needs to be exercised many times before he is captured.

Among the many peculiar characteristics of the dragon fly I find he has considerable curiosity. I stood for half an hour one bright sunny day on the end of a culvert over the stream that ran from a little marsh filled with cattails. Here and there flew two large dragon flies, their gauzy wings glistening in the sunlight. They darted past me—out of reach of the net—then returned a little closer. One would stand still before me with those wonderful wings so swiftly vibrating that I could scarcely see them. I moved the net a little and away he darted, only to return a moment later and come a little closer. This he did repeatedly, each time coming closer and closer, glaring at me and the net. I made two or three attempts to catch him, but I had miscalculated the distance. Once the frame of the net struck him and knocked him nearly into the water. I had to wait a minute or two on these occasions before he came near me again. Finally his curiosity got the better of him and he came directly toward me by successive little darts until he was within two feet of the net—and he was mine.

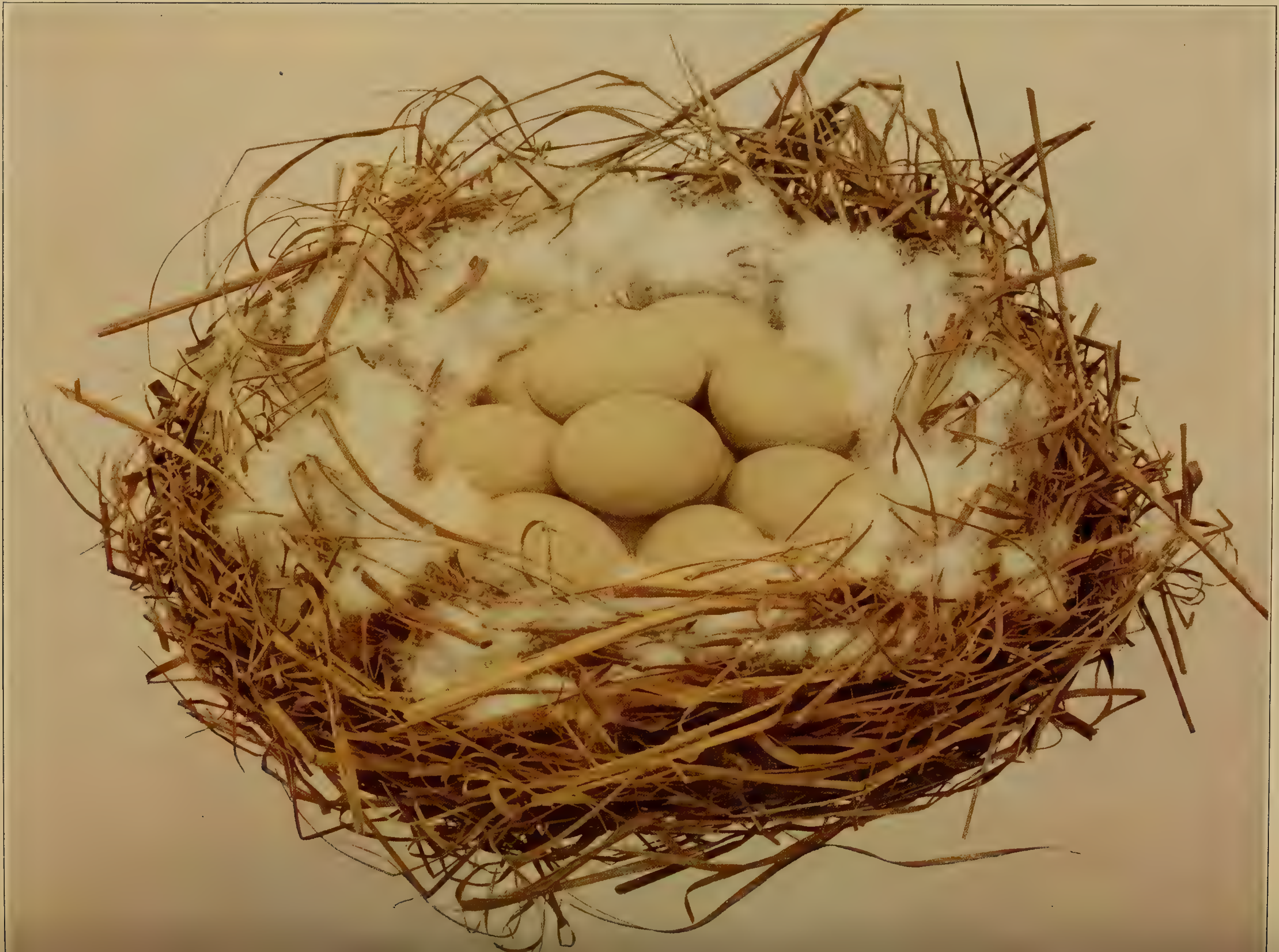
He is very voracious. It is stated that he will even eat his own body when offered to him. Beutenmüller held one of the large ones captive and found he devoured forty house flies in two hours, while a smaller one ate twenty-five in the same time. In some localities he is cared for and bred in order to rid the community of mosquitoes, although he is not so successful in this work as many think. Taken all in all he is a most attractive and interesting creature.

Alvin M. Hendee.

A SCARLET TANAGER.

Athwart the shadows of the woods,
Flashes a meteor's light,
With wings like scarlet poppy-leaves,
A tanager gleams bright.

—Illyria Turner.



A Redhead disturbed from her nest or young displays great uneasiness, often circles about overhead, then darts past the intruder, continually "quacking" and endeavoring in every way to divert his attention. During the nesting period the drakes enjoy basking in the sun, on the sandy shores and reefs; sometimes twenty-five are seen crowded together on a little sand bar out in the lake.

The eggs are elliptical or oval in shape, varying from light greenish or grayish drab to a creamy or buff color, measuring 2.30 to 2.42 inches in length by 1.70 inches in breadth. I found six to fifteen eggs in a single nest, and my companion discovered one containing twenty-one eggs. These may have been deposited by different Redheads, as eggs of the Redhead and canvasback have been found together in the same nest. It is not unlikely that two females of the same species used the same nest, which probably accounts for the twenty-one eggs found by my friend. The eggs are readily distinguished from those of the canvasback, the latter being dark green or greenish drab.

Soon after incubation commences, if not before, the mother bird plucks the down from her breast and lines the interior of her nest with the light grayish, or almost white, substance. (The down of the canvasback is bluish gray or mouse color.) Thus, while sitting, her eggs are given full benefit of the warmth from her body, and when she desires to leave the nest she has but to cover the eggs with the down. This enables the parent bird to remain away from her nest hours at a time, with no fear that her treasures will suffer from exposure during her absence.

It was late one afternoon on a balmy June day that I left our camp among the small timbers bordering a picturesque lake, in what is known as the Devil's Lake Region of North Dakota. My intention was to visit a small poplar grove some distance up the shore. I took a roundabout course, with the hope of finding something interesting, and, as I wound my way through the slough which lay before me, I espied a Pochard as she arose from the marsh some fifty yards ahead. About ten minutes later, after struggling through tangled vegetation in water knee deep, I found myself standing before a tuft of grass which seemed to contain something suspicious. Peering through an opening I saw the tell-tale down, which was unmistakable evidence that I had found her nest. I parted the grass and burrowed with my hand into what appeared a ball of hay and feathers, and I soon disclosed ten glossy eggs, which, together with the nest, are shown in the accompanying illustration.

GERARD ALAN ABBOTT.

THE LOON.

Masterless thing am I,
Fearing no God,
Heeding no rod,
Free as free thought I fly.

Far 'neath the old witch moon,
Isle-studded lake,
Marsh, fen, and brake
Wail to the moan of the loon.

Madman and outcast I,
With my mad mate,
Early and late,
Harry the hollow sky.

Scorned of all winged things,
Scorning their scorn,
Evening and morn
Through the wild waste there rings

Out from the drowned north land,
Weirdly the croon
Of the lone loon
Banned by the outlaw's brand.

GEORGE CAREY.

THE ROSE IN MYTH AND HISTORY.

The rose occupies an unique position in the floral community. No other flower is surrounded by such a wealth of fact and fancy, of romance and tradition, as this queen of the field and the garden which graces impartially, the dawn, the meridian and the close of human existence. At all times and in all ages since man appeared upon this planet, fair Rosa has been the chosen flower for the sacraments, festivities and conspiracies of barbaric and civilized man. Church and state have exalted her, Minerva and Bacchus have courted her favor and Mars has chosen her for his emblem.

Geologically, the rose is ancient. Thousands of years ago, during the tertian period, the ancestors of the American Beauty, were born to blush unseen and waste their fragrance on the dinosaurians and other unduly elaborated reptiles that frequented the landscapes of prehistoric epochs. Even at that early date they foresaw a field of utility apart from their accepted function of ornamentation. In their struggle for existence, they evolved the pear, apple, peach, cherry, blackberry, strawberry and many other forms that make glad the heart of man.

Historically, the rose is ancient of days. Herodotus speaks of the double rose and Solomon, when his attention was temporarily diverted from the lilies of the field, gave praise to the rose of Sharon and the rose beds of Jericho. Theophrastus speaks of the roses in the Isle of Rhodes (isle of roses), so called from the extensive culture of the plants carried on there and Egyptian records make mention of presents of roses sent to Rome along with the grain, which was the staple article of commerce.

Paestum and Samos were famous for their roses. There the plants blossomed twice each year and the magnificent flowers were sent in ship loads to Rome to supply the demand for garlands and decorations. It would appear that the people on the seven hills fairly wallowed in the flowers. Nero compelled his hosts to have their fountains filled with rose water, to supply all guests with garlands composed of roses, violets and myrtle and to set forth rose wines, and rose puddings, after eating which, refreshment in the form of rose baths, were furnished.

If after breathing, wearing, eating, drinking, lying on, walking over and sleeping on roses, the hapless ancient was taken sick, he was said to be "a rose in aromatic pain." This floral diagnosis, however, was cold comfort, and doubtless operated on the men of the forum in much the same manner as on those who in our own day are afflicted with rose colds which become manifest about the opening of the fishing season. When Saladin captured Jerusalem in 1128 he refused to enter the shrine of the temple until it had been thoroughly purified with rose water. A similar instance occurred when Mohammed took Constantinople in 1453. The prophet ordered the cleansing of the church of Sophia with rose water, before it could be transformed into a mosque.

The high esteem in which rose water was held by the ancients led, in one instance, to the discovery of an important commercial product of the rose. It appears that many years ago, when India was in full possession of her power and riches, the celebrated and beautiful Princess Nourmahal entertained the Grand Mogul with unparalleled magnificence. A feature of the entertainment was an excursion along the grand canal in the princess' ship of state. As water would not serve the purposes of the occasion, the entire canal was filled with rose water. During the progress of this aesthetic navigation the heat of the sun disengaged the essential oil from the rose water, and some of this being collected, the otto or attar of roses was discovered. The Catholic Church has always paid especial reverence to the rose. The custom of blessing the flower, still observed in Rome, being celebrated on the day known as Dominica in Rosa. Its architectural adaptation is seen in most of the decorations of the Catholic Churches, the motif of which is the rose in combination with the cross. The rosary derives its name from association with the flower. It appears that there is some acid in the petals of the rose that has a peculiar action on iron. This is taken advantage of in the manufacture of rosaries. The petals, cloves and other spices are pounded together in an iron mortar until a thick black paste is formed, which, when exposed to the air, becomes hard and is then turned and polished to produce the perfumed beads.

The old Latin maxim that the rose is born amid thorns is only a plagiarism of the older Israelitish proverb that "he who delighteth his nose by walking on roses will find his feet full of unpleasant prickles." Asia as well as Europe was long familiar with the plant and its reverence in all climes has brought about it many associations and traditions, both pagan and Christian.

As the national flower of England, many theories have been advanced to account for the selection of the red and white rose as the emblem of the two great factions whose struggles for supremacy are known as the "wars of the roses." Shakespeare has given the most probable origin of the famous badges. According to the great dramatist the Duke of York and Earl of Somerset, together with their followers, were engaged in an altercation in the gardens of the Temple. After high and angry words had passed between the representatives of the two great families, York called upon all who believed in his statements to show their faith by plucking a white rose. Somerset immediately requested a similar demonstration by a selection of a red rose, and so the two flowers divided the company, and later on, nearly divided a kingdom.

In spite of all the splendid flowers that have resulted from modern horticulture, the rose has maintained its scepter, and it is not surprising that the ancients should have had many stories accounting for its origin. In almost every instance, these traditions and myths are in some way associated with the sentiments of the heart. Among the Greeks and Latins the rose was dedicated to Cupid or his mother, who excelled all rivals, as does the rose. It was also said to be the transformed body of a nymph, Apollo giving the vivifying power of his beams, Bacchus bathing her in nectar, Vertuminous lending the perfume, Pomona the fruit, and Flora the diadem of flowers.

Originally the rose was white and it has kept people busy, in all countries, accounting for its change of color. According to Theocritus, the flowers were stained by blood from the foot of Venus, who stepped on the thorns, while hastening to succor the wounded Adonis. Anacreon claims that the rose was dyed with nectar by the gods when it was first created, but another version states that Cupid, while leading a dance on Mount Olympus, overturned a vase of nectar, thus staining the white petals. On one occasion Venus got after Cupid and thrashed him so soundly with a rose branch that the buds became stained; but a far more satisfactory explanation is that the rose was dedicated to Aurora, and reflects the glory of her countenance, even as the blush rose retains the color from Psyche's glowing cheek.

Medieval French writers have much to say in this connection. Rosalia was a beautiful maiden, who, exciting the jealousy of Diana, was stricken down, and her lover rushing to her rescue, found her transformed into a tree of flowers, to which he gave her name.

Rapin, a French Jesuit, states that a queen of Corinth, possessing extraordinary beauty, being pursued by her three lovers, took refuge in a temple of Apollo and Diana. Apollo, to shield her, changed her into a rose bush, in which form she still rules as queen, while the lovers were made to take the forms of a butterfly, a moth and a beetle, which continue to hover about their transformed mistress. The queen is protected by her subjects, who were changed into thorns.

Among the eastern nations the Turks believe that the rose sprung from the blood of Mohammed. Whenever they find one of the flowers lying on the ground it is carefully raised, reverentially kissed and laid tenderly away. The followers of Zoroaster believe that before the coming of sin into the world the rose bush had no thorns, while the Ghebers think that when their infant prophet Abraham was thrown into the fire by Nimrod the flames turned into a bed of roses, whereon the sacred child reposed.

The burning bush in which the Lord appeared to Moses was changed into a rose tree and Christianity claims that a white rose bloomed at the foot of the cross and was stained by the blood of the Redeemer.

Roses are said to be a sure preventative of drunkenness. Hence the bibulous Romans wound garlands around their heads in order to prevent undue enlargement. At their banquets roses were hung above the tables as a sign that stories told there should not be repeated; hence the expression "sub rosa," signifying secrecy.

Cupid once gave a rose to Hippocrates as a bribe not to reveal the loves of Venus. As a result it became a symbol of silence and the rose decorations in many dining halls are a relic of these ideas. The early popes often placed consecrated roses over the confessional to denote secrecy, while the Chinese not only use them in this sense, but also as an emblem of immortality.

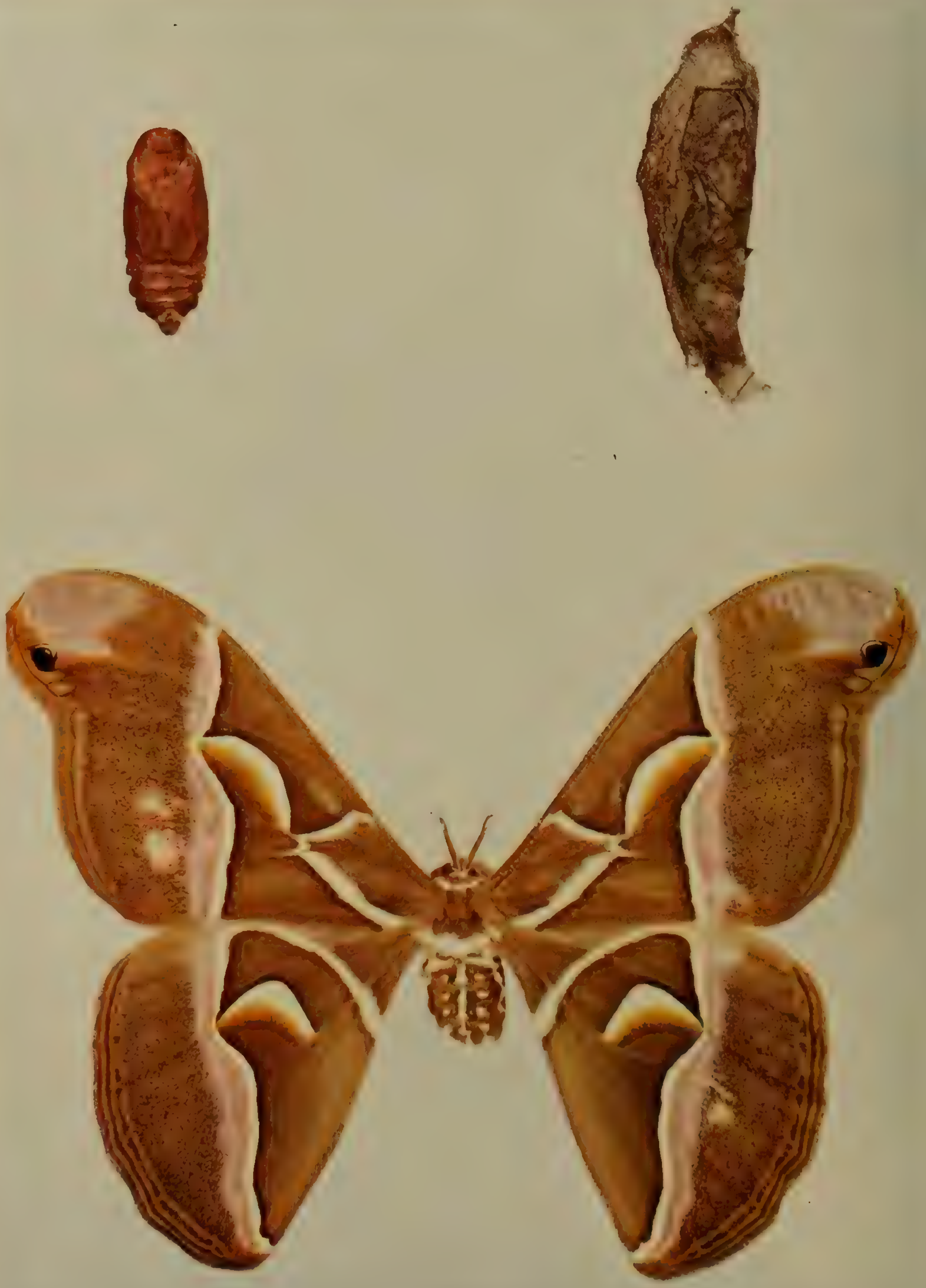
Many of the existing varieties of roses have been produced by crossing European with imported forms, especially with the China rose, which was introduced into England in 1789. The musk rose was brought from Italy in 1592 and the single yellow rose from Syria, in 1629. The moss rose hailed from the land of dykes and delft early in the eighteenth century, while China appropriately contributed the tea rose in 1825.

CHARLES S. RADDIN.

A BOWL OF ROSES.

A dozen slender stems of perfect grace—
A myriad clustering leaves of misty sheen
That mass and tangle and together lean,
And shine and shimmer like an ocean space—
And as the cool sea wave that wins the race,
Crowned with the early, morn-flushed foam, is seen,
So rest the blossoms 'gainst this sea of green,
With blushing heads uplift, or drooping face;
And each holds in its heart a touch of flame
That glows and glimmers like the eye of love,
And each a sweetness that no word can name;
And over all, a charm, fine and complete
That thrills the soul, as if from heaven above,
Through open gates came music low and sweet.

HARRIET WARNER HIGLEY.



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CYNTHIA SILKWORM.
(Samia cynthia).
About Life-size.

THE CYNTHIA SILKWORM MOTH.

(*Samia cynthia.*)

To the Chinese must be credited the discovery of silk and the originating of the silk industry. Even before the year 2640 B. C. they had knowledge of the larvae—

> "That in their green shops weave the smooth-haired silk."

It was the mulberry-feeding moth which produces the finest silk of to-day, that was known to these early Chinese. They, and later other nations with them, encouraged its cultivation, until now the insect has become thoroughly domesticated and lost many of the characteristics of its wild state.

The Chinese also discovered that there were other moths, the larvae of which spun a cocoon of silken threads in which to pass the period of its transformation into an adult moth. Among these moths is the Cynthia of our illustration. It is a native of India, China and the adjacent islands, and has been domesticated as a source of silk in some provinces of China and India. The Cynthia moth has also been introduced into other countries, not classed as silk-producing districts. In both Europe and America it is easily reared and, it would seem, readily acclimated. Unlike the mulberry silkworm, the Cynthia is not seriously affected by exposure to moisture. In fact, a certain amount of moisture seems necessary for its best development. An authority states that "the caterpillar drinks greedily" and he advises in the case of indoor culture that "the branches, when served fresh, should either be dipped in water or sprinkled abundantly, particularly after the third moult."

The Cynthia caterpillar feeds upon the luxuriant foliage of the Ailanthus or "Tree of Heaven." It has a remarkable appetite, which seems to increase with the increase of the food supply. This is peculiarly observable toward the close of the carterpillar life, say, after the third moult, when the craving seems to be insatiable. The general color of the caterpillar is yellow, with transverse rows of small black spots, and the head is black. After it moults the first time the yellow color becomes more brilliant. After the second moulting the color becomes much lighter, and the third casting of its skin presents a creature with a white skin with black spots and yellow legs and head.

The cocoon is large and the thread is fine. Owing to the difficulty of dissolving the gum which is secreted by the larva to make the silken walls of the cocoon firm and strong, the silk is not easily unwound. It is, therefore, usually carded and the yarn is woven into a most durable silk cloth of a loose texture. English manufacturers have given the opinion that "the silk from the Cynthia may be made into shawls equal to the best India."

An enthusiastic writer on the possibilities of the Cynthia silkworm culture says: "When nearly full-grown the clusters of fine caterpillars, set off by the rich green of the Ailanthus leaf, forms a very beautiful sight; and although I can not conscientiously recommend such an ornament for the drawing room table, it certainly may be placed almost anywhere without being offensive to the most fastidious eye. Plenty of air and light should be given them, but they should not be exposed to the direct rays of the sun. Reared even from motives of curiosity, and without a view to immediate pecuniary results, the task can not be performed without teaching a lesson which will be of infinite value to the mind anxious to inform itself of the wonderful workings of that law of nature that transforms a small crawling animal into a beautiful flying creature "large enough to be mistaken for a bird."

OUR BIRDS IN WINTER.

When the days of early spring awaken in nature's slumbering life, we greet each arriving bird as a harbinger of coming summer gladness more than for any striking beauty in their plumage or music in their song. With their love notes they gladden us and there is harmony in their active restlessness and the starting into renewed growth of grass and tree.

But to fully understand bird nature we must study our winter residents and winter visitors. We then see them in their everyday dress and manners, when intent only on the matter of existence. We may say that winter is their vacation, when they relax somewhat from the cares and duties of life. Our winter birds are better-natured than are our summer residents, including those which remain with us the entire year, and not excepting the pugnacious sparrow which then becomes quite sociable and even inclined to gayety. I have yet to note a serious case of ill-will or disagreement among our winter birds, though they each know their place and keep it. While their vocal efforts may not be altogether productive of harmonious sounds, yet they are full of cheer. Even the cawing of the crow or the shrill cry of the jay is a pleasant sound in mid-winter. Either the birds were more plentiful the past winter or they were more closely observed, for no less than twenty varieties were noted around the yard and orchard. The turtle doves in considerable numbers remained with us all winter, and they and the quails have mingled with the poultry at feeding time, in quite a domestic manner. A meat bone with scraps of meat attached, fastened to a tree near the kitchen window, has been a source of much enjoyment to the birds and of entertainment to the inmates of the house. The downy and the hairy woodpeckers were daily visitors, and the white-breasted nut hatch came occasionally and amused us with his acrobatic feats, running around the tree, head downward. The chickadees in unknown numbers rarely failed to call each day for a repast, and enlivened many an hour by their active cheerfulness. A woodpecker that I was not then able to name and could not find described in any work at hand was a frequent visitor. He was a royal fellow, and it annoyed me because I could not call him by name. I have since learned that it was the red-bellied woodpecker and that they are permanent residents in Iowa in considerable numbers. Even the juncos did not disdain to take an occasional peck at that bone, by way of a change from their regular diet of seeds. But the junco, Labrador snow birds and winter sparrows show better when the fast falling snow covers weeds and stubble, and on a cleared space on the south porch a liberal supply of meal or crumbs was scattered. I sat by the window and watched. It was not for long. Soon they came, one at a time, by twos and threes. How they twittered and hopped about and pecked at the crumbs. I wish I understood their language, for they talked animatedly about something pleasant, I know. I watched them scratch the falling snow away, not like a hen, with one foot at a time, but with both feet at once.

Some bright morning, after a period of unusual cold or storm-depressing weather, one realizes that the jays are still with us, not by their shrill shrieks of alarm, like the hawk, but by their clear, bell-like call, which is the pleasantest of all their many notes, and by a glimpse of their conspicuous, natty dress suits, which make a pleasing diversion in the monotony of winter.

L. O. Mosher.

BERRIES AND THEIR NAMES

The strawberry stands easily at the head of its tribe for beauty, size, flavor and fragrance. It belongs to the royal family of the rose, and grows wild in the pine woods, showing a dainty cluster of white flowers in early spring, and later on a bunch of exquisite crimson berries of delicate acid flavor. The thick carpet of fallen pine needles keeps the berries clean and dry. There have been two or three theories about the meaning of the name strawberry, but all agree that it comes from the old Saxon word that means to stray oneself, or strew and spread abroad other things. Straw, or the stems of wheat, barley and rye, is so called because of men's strewing or spreading it out in the fields to dry. Some persons suppose the little fruit stalks that hold up the berries came by their name by the resemblance to small straws. Others attribute it to the habit of spreading straw under the berries in gardens to keep them clean and dry as the pine needles do in the woods. But most authorities believe the name comes from the plant's way of growth, sending out "runners," or straying by them from their original place. It is almost impossible to keep strawberries from mixing, no matter how far apart they are planted, and they are not easily kept within bounds, so that they are really stray-berries, or vagrants. Yet there was never a more charming runaway.

Blackberries and dewberries need no explanation of their names, but we hardly recognize the appropriateness of raspberry, as from rasp or rough, since the gardener's art has made them so velvety and smooth. The whortleberry or huckleberry is said to be a diminutive of a word meaning shrub, and is so called from its low growth in bogs and marshes, as well as in woods. Another theory is that whortle is a corruption of myrtle—myrtle berry, a belief which Linnæus held, as he has introduced myrtle into the Latin name of the bilberry. The different varieties of this fruit have many different folk-names—the tangleberry, or dangleberry, the deerberry, buckberry or squaw huckleberry, the low-bush and high-bush, and the creeping snowberry. There are almost as many as the names of the wintergreen tribe, partridgeberry, bear's grape, foxberry, nealberry, kinnikinic,—and for the same reason, because beloved and noticed by the common folks, and associated with the animals in their forests. The whortleberry or myrtleberry is a native of both the old world and the new, and is found even in Greenland and Iceland, where the women make up large camping parties in summer to gather the fruit. There is a red variety of this tribe, and also a rare white one, but most of the berries are dark blue and are called blueberries in the peat bogs of Scotland. Bilberries are supposed to be a corruption possibly of ballberries, from their round shape. The cranberries take their name from the arrival of the cranes, ripening as they do in the salt marshes near the sea about the time for the arrival of the flocks of cranes in their annual migrations. No doubt the rural folks who gathered the low red berries quickly associated them with the time for the harsh cries and grotesque figures of the cranes flying overhead, and such associations have been the origin of many flower names, such as wake-robin, robin plantain, cuckoo-flower, and others, as well as the animal names already mentioned.

ELLA F. MOSBY.

PEARL

Pearl is not a mineral in the strict sense of the word, but has long been associated with gems in thought and use.

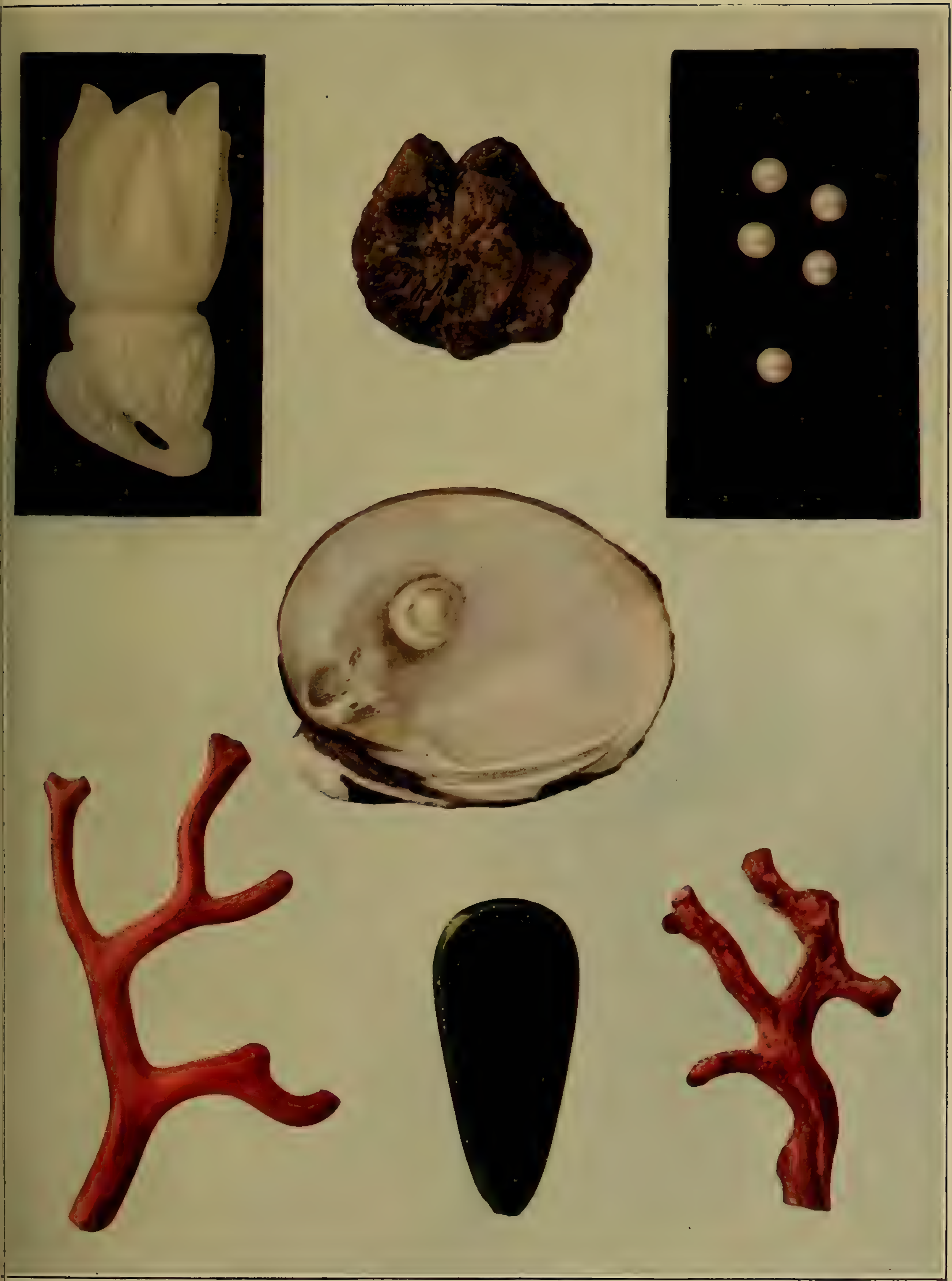
Like amber, jet and coral, Pearls are a product of organic or living forces, not of inorganic nature. Mollusks, chiefly of the order of bivalves, are the organisms which produce Pearls. They are a product, however, not of health and normal life, but of disease and abnormal conditions. This is well known by the Pearl fishers, so that, in searching for Pearls, they pass by the young, well-formed mollusks, to gather only those appearing old, diseased and distorted. The formation of Pearls by a mollusk is generally the result of some persistent irritation of the mantle. The agent of irritation may be a grain of sand, a bit of seaweed, an infusorian, a parasite or an egg of the mollusk itself. In other cases the agent of irritation is not known, as many Pearls show no change of composition at the center on being cut open. Ordinarily, however, the origin of the Pearl seems to be an effort on the part of the mollusk to protect itself from such an irritant as one of those above mentioned by secreting over it a calcareous deposit similar to that of which it forms its shell. This deposit will have the color and character of the interior of the shell or, if the color of the shell varies in different portions, that of the part of the shell which is nearest. Unless the interior of the shell possesses the peculiar nacreous luster desired in Pearls, these will be of no value.

The form and size of the Pearls produced by mollusks varies considerably. Only those which are perfectly spherical or drop-shaped are considered of first quality for jewelry, but these are only a small part of the forms produced. Irregular protuberances or convexities often distort the spherical form and highly complex and grotesque shapes occur. One such Pearl is known having a remarkable resemblance to a bust of Michael Angelo. Others resemble insects or fruits. These resemblances can be enhanced by proper mounting and the addition of a little gold and enamel. Some fanciful work of this kind has been done and a large collection of such Pearls is preserved in the Green Vaults in Dresden. Such Pearls are known as baroques and formerly had comparatively little value, but at the present time they are being employed in the most costly jewelry. Not infrequently the Pearl becomes attached to the interior of the shell as is the one shown in the accompanying plate. Such Pearls can be used by cutting them away from the shell, but they have much less value than those well-formed on all sides. Loose Pearls which form flat on one side, are called button pearls, and are worth only about twenty-five per cent. less than round Pearls. Again, Pearls may be hollow. Such are called coque de perle, and have little value if their hollow nature be known. This, however, is not always the case, as is shown by an instance mentioned by Kunz of a New York lady who had purchased a Pearl apparently of good quality, except for a little black spot on one side. This was mounted and worn as an article of jewelry until, while its owner was applauding at the opera one evening, the Pearl broke and disclosed its interior filled with a white, greasy clay.

The Chinese take advantage of the habit of mollusks to cover any intruded substance with Pearl, to introduce into the shells of these animals, under the mantle, beads and small images. The mollusk is returned to the water and in about a year's time taken out again, when the objects are found to be coated with a pearly substance. Pearls so formed, however, are comparatively dark and lusterless and have by no means the value of those of wholly natural origin.

Pearls vary in size from those of microscopic dimensions to those as large as a pigeon's egg. The latter are, of course, very rare.

The Shah of Persia is said to possess the largest pearl, it being about one and one-third inches in length in one direction and one inch in another. A Pearl in the Austrian crown weighs 300 car-



PEARLS LOANED BY JUERGENS & ANDERSON, CHICAGO.
CORAL LOANED BY A. W. CONNER, CHICAGO.

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Jade, Variety Jadeite, Carved (Burmah). Chrysoberyl (Russia). Pearls (Oriental).
Fresh Water Pearl, Grown to Shell.
Precious Coral, Polished (Mediterranean Sea). Jade, Variety Nephrite, Polished (New Zealand). Precious Coral (Mediterranean Sea).

ats and one in the South Kensington Museum weighs 455 carats. The small Pearls used in jewelry are known as seed, dust or sand Pearls.

Pearls are chiefly white in color, but many are tinted yellow or pink; some are grey, green or purple and many other colors occur. Black Pearls are obtained in certain fisheries. The Pearls from the Unios of North America are of almost every shade.

Pearls of pure white color, if of the proper luster, are those most highly prized in Europe and America, although a slight pinkish tinge does not injure the value. They must, however, have the transparency of the true Pearl and not be "chalky."

In China and India, Pearls of yellow color are preferred.

The hardness of Pearl is 4 and its specific gravity 2.65-2.68. It is thus like that of shell or "mother of Pearl," which might be expected from the fact that both are of the same chemical composition—carbonate of lime. Owing to their low hardness Pearls are easily scratched and on account of their composition are attacked by acids. They thus deteriorate with age, losing their polish and luster and often becoming black and unsightly. No way of restoring the luster of Pearls is known, although occasionally the outer marred coating can be removed by those skilled in the art and an equally lustrous surface be found beneath. To preserve Pearls as long as possible they should be wiped with a clean linen cloth each time after being worn, and be kept in a dust-tight box, carefully wrapped in linen. Hot or boiling water injures and in time destroys their luster, and many valuable Pearls have been ruined because the mollusk which contained them was boiled before opening.

The mollusks which yield Pearls are many, and Pearl fishing is an industry carried on in many parts of the globe.

The Pearl mollusk or Pearl oyster, *par excellence,* is that known by the scientific name of Meleagrina (Avicula) margaritifera. This mollusk has a bivalve shell averaging seven or eight inches in diameter and generally thick. The exterior is of a greenish black color, while the interior is silver white with pearly luster. The latter forms indeed the well-known "mother of Pearl." This mollusk inhabits warm seas, occurring especially in sheltered localities in the Indian Ocean and occasionally throughout the tropical zone of the Pacific Ocean. It groups itself in colonies like the common oyster, usually on coral banks, at a depth of twenty to thirty feet. It is not free moving, but attached by a byssus, which must be severed before the mollusk can be brought to the surface. The Pearl fisheries of the Indian Ocean chiefly center in the Straits of Manaar between India and Ceylon. The fishing is largely confined to the months of March and April, as the sea favors best at that time, and at that season from 15,000 to 20,000 fishers and dealers are said to gather along the Pearl Coasts. The oysters are obtained by divers, who go out in boats and secure the shells by diving. They usually dive without appliances and work under the water simply by holding their breath for the time. Some fishers, however, make use of diving suits and bells. The work is dangerous, not only on account of the bodily strain, but because sharks prey upon the divers. The oysters are unloaded from the boats into pits on the shore, where they are left to putrefy, and the Pearls are then washed out.

Other localities in the Orient where the Pearl oyster occurs and where Pearl fishing is carried on in the same manner as above described are the Persian Gulf, the Red Sea and the Sulu Archipelago. The Red Sea fisheries furnished in earlier times an extensive supply of Pearls and were probably the source of those used by the Romans. They are now, however, largely exhausted. The Persian Gulf Pearls are inferior in color to those of Ceylon and are known as "Bombay" Pearls. The Ceylon fisheries are under control of the colonial government and are carefully guarded to prevent exhaustion of the supply. The localities where the fishers are to work are staked off and when an area has once been worked over it is allowed to lie "fallow" for seven years, so as to allow a new crop to grow.

So far as the American continent is concerned, the true Pearl oyster is found chiefly in the Gulf of California. It occurs here both on the east and west coast and as far south on the Pacific Coast as the northern boundary of Guatemala. It is also found on the Brazilian coast and the western shores of South America.

The California Pearl fisheries were in operation at the time of the invasion by Cortez and he sent a number of fine Pearls which he obtained there to the Queen of Spain. Since that time the fisheries have been carried on with a varying degree of persistence from time to time, the beds having occasionally become practically exhausted through too reckless dredging. The right to work the beds is held by the Mexican government, and the fisheries are leased by it to different companies. Both the shells and the Pearls are of value, the sales of the one reaching as high a figure as of the other. Black Pearls are the specialty of these fisheries and some of the finest known have been found here. The total annual product from the fisheries reaches at the present time a value of half a million dollars a year. American Pearls are known in trade as "Panama" Pearls and bring a somewhat lower price than those of the Orient.

Besides the Pearl oyster of the sea, a number of mussels which make their home in the beds of fresh water streams or lakes produce fine Pearls. These mollusks belong chiefly to the family Unionidae, and include many species. They are bivalves and live both in the beds of running streams and in still bodies of water on muddy bottoms. They are usually to be found at a depth below the surface of the water of from two to twenty feet. They lie either on the surface of the mud or partly imbedded in it, and with their valves slightly open, to allow access of water containing oxygen and food. At the slightest touch the valves close and remain so until danger is past. The lumbermen of Canada take advantage of this peculiarity to collect the mollusks (for food) by tying bushes on the rear of their rafts as they float down stream, to which the clams attach themselves in considerable numbers. A somewhat similar method is pursued by the fishermen of the Mississippi valley, who collect the clams in great numbers for the manufacture of Pearl buttons. They row about with long iron rods fastened across their boats, from which at intervals series of hooks and chains dangle in the water, and to these the mollusks attach themselves. The mollusks are removed from their shells by boiling, hence any Pearls which they might contain are rendered worthless. The same method of fishing might, however, be used to gather shells for Pearls. Other methods used to gather the mollusks to search for Pearls are, raking the bottom with an iron rake, wading with naked feet and picking up any projecting shell as it is felt, or systematic dredging. The use of a water telescope is said to facilitate the work of individual search for mollusks likely to contain Pearls. It consists simply of a long, light, wooden box, one end of which is strapped to the face, while the other, covered with glass, is immersed in the water. Provided with this appliance the bottom of a river or lake can be searched carefully. Enormous quantities of the Unios are destroyed in the search for Pearls and the supply has become considerably diminished in consequence. This waste might be avoided if care was used in opening the shell not to injure the animal. This work is performed in Germany by a thin blade of steel about an inch in width and bent at a right angle about an inch from the end. The thin blade is inserted between the valves and then turned at right angles so that the shell is opened the width of the blade. The operator can then feel about for Pearls and if none are found return the mollusk to the water without having injured it. The search for Pearls in this country is usually carried on by persons out of regular employment and has rarely been reduced to a systematic occupation. The total value of the Pearls which have been obtained, however, is great and their price is steadily increasing. One of the first Pearls found in this country was obtained near Paterson, New Jersey, in 1857. This Pearl brought at its first sale $2,500, and is today worth $10,000. A sky-blue Pearl weighing ninety-three grains, found in Caney Fork, Tennessee, in 1897, was sold in London for $3,300. Pearls valued at from $100 to $1,000 are frequently found in the waters of the interior States, such as Wisconsin, Minnesota and Arkansas. In Arkansas large numbers of valuable Pearls have been found loose in the streams and many of the pearl hunters are of the opinion that the mollusks "shed" their Pearls at intervals. While the region of the Mississippi valley is that in which the Pearl-bearing mollusks chiefly abound, they occur also in the waters of the Eastern States, and these furnish an appreciable supply.

The common oysters and clams of the temperate sea coasts produce Pearls no less than those of fresh waters, but they lack the desired luster and transparency and are considered of no value. Some gastropod or univalve mollusks also produce Pearls, among which may be mentioned the Strombus of the West Indies and the Turritella of the East Indies. These Pearls are of rose tint but are liable to fade and lack also the transparency of the true Pearl.

Pearls seem to have been valued by people of all times, both civilized and uncivilized. The Hebrew Scriptures make frequent references to them and there are many incidents in history showing the esteem in which they were held by the Greeks and Romans. The best known of these is probably Cleopatra's wager with Antony that at a single meal she would swallow the value of a whole province. In pursuance of this boast she is said to have dissolved a Pearl of great value in a glass of sour wine and then to have drank the wine. It may be worth noting that this story cannot be literally true, since a Pearl of the size reported would only slightly dissolve in such a mixture. If ground to a fine powder, however, the Pearl might be swallowed in the wine without injury to the system, and if this was done the story can be credited. According to Pliny the wealthy Romans were accustomed to mix Pearls with their wine, presumably in this way, to improve the flavor of the beverage. The name for the Pearl among the Romans and Greeks was "Margarita," and the finest Pearls are still known by this term.

The ancients believed that Pearls were solidified drops of dew which had fallen into the gaping shells of the oysters. Among the Chinese and Hindoos to this day Pearls are regarded as of great medicinal value, and a large proportion of the imperfect Pearls obtained in the fisheries are used for this purpose. The Aztecs and Incas of America, when first visited by the Spaniards, possessed quantities of Pearls of the finest luster and color. Large numbers of Pearls are found in the prehistoric mounds of America also, showing that even these people held them in esteem. These Pearls generally lack the luster of the Pearl of the present day, but whether this has been lost through lapse of time or whether the Mound Builders were content with Pearls that would to modern people seem valueless is not known. The mound Pearls are frequently found bored and strung.

The passion for Pearls continues at the present day and they often command even higher prices than the diamond. The price, however, depends so much upon individual quality that no fixed scale of values can be given.

Emanuel gives the following quailifications as necessary to a perfect Pearl:

1. It must be perfectly round or drop-shaped, seeming as if fashioned or turned into shape.
2. It must have a perfectly pure white color.
3. It must be slightly transparent.
4. It must be free from specks, spots, or blemish.
5. It must possess the peculiar luster characteristic of the gem.

Pearls are sold by their weight in grains, rather than that in carats, four grains equaling a carat. Seed Pearls weighing one grain are worth from one to three dollars each. With the increase in size, however, the increase in price is rapid, a two-grain Pearl being worth, for instance, four times as much as a one-grain Pearl, a three-grain Pearl nine times as much, and so on. The largest Pearls bring, like the largest diamonds, individual prices. The Pearl is perhaps the only gem that does not need to have its beauties enhanced by cutting, nor can any polishing process improve its surface. The favorite use of Pearls is to string them in necklaces, but they are also often set around other stones to heighten their effect or they are used alone in rings.

There are numerous ways of producing imitation Pearls, one of which, invented many years ago by a French bead maker named Jacquin, gives remarkably accurate reproductions. The Jacquin Pearls are made from an easily fusible bluish glass, which is first drawn into tubes, and from these, hollow globules of the desired size are blown. These are covered on the inside with a solution of isinglass and a substance called essence of Pearl, which is blown in warm and spread over the interior by rapid motion. When dry the globules are filled with wax. The essence of Pearl, which constitutes the important feature of Jacquin's process, consists of a silvery substance found beneath the scales of the fish known as the bleak (Cyprinus alburnus). It is in the form of thin, irregular rhombic plates, and is obtained by washing the scales, one pound of essence being derived from seven pounds of scales. From 18,000 to 20,000 fish are required to produce the latter amount of scales. The substance is, therefore, costly, and owing to this fact and the amount of labor and skill required to make the Pearls, they bring a considerable price. They can be distinguished from genuine Pearls by their greater hardness and a colder feeling in the hand. The holes in the false Pearls, moreover, are comparatively large and have a blunt edge, while those made in real Pearls are small and have a sharp edge. False Pearls are sometimes made by turning pieces of mother of Pearl into a spherical form, but they are clumsy imitations and can be at once detected by the difference of luster as a whole and the variations of luster on different surfaces. A very good imitation of black Pearls is made by cutting pieces of hematite into a spherical form. These counterfeit the luster of the black Pearl in a remarkable degree, but can be distinguished by their greater weight and hardness.

Oliver Cummings Farrington.

IN A GARDEN OF ROSES.

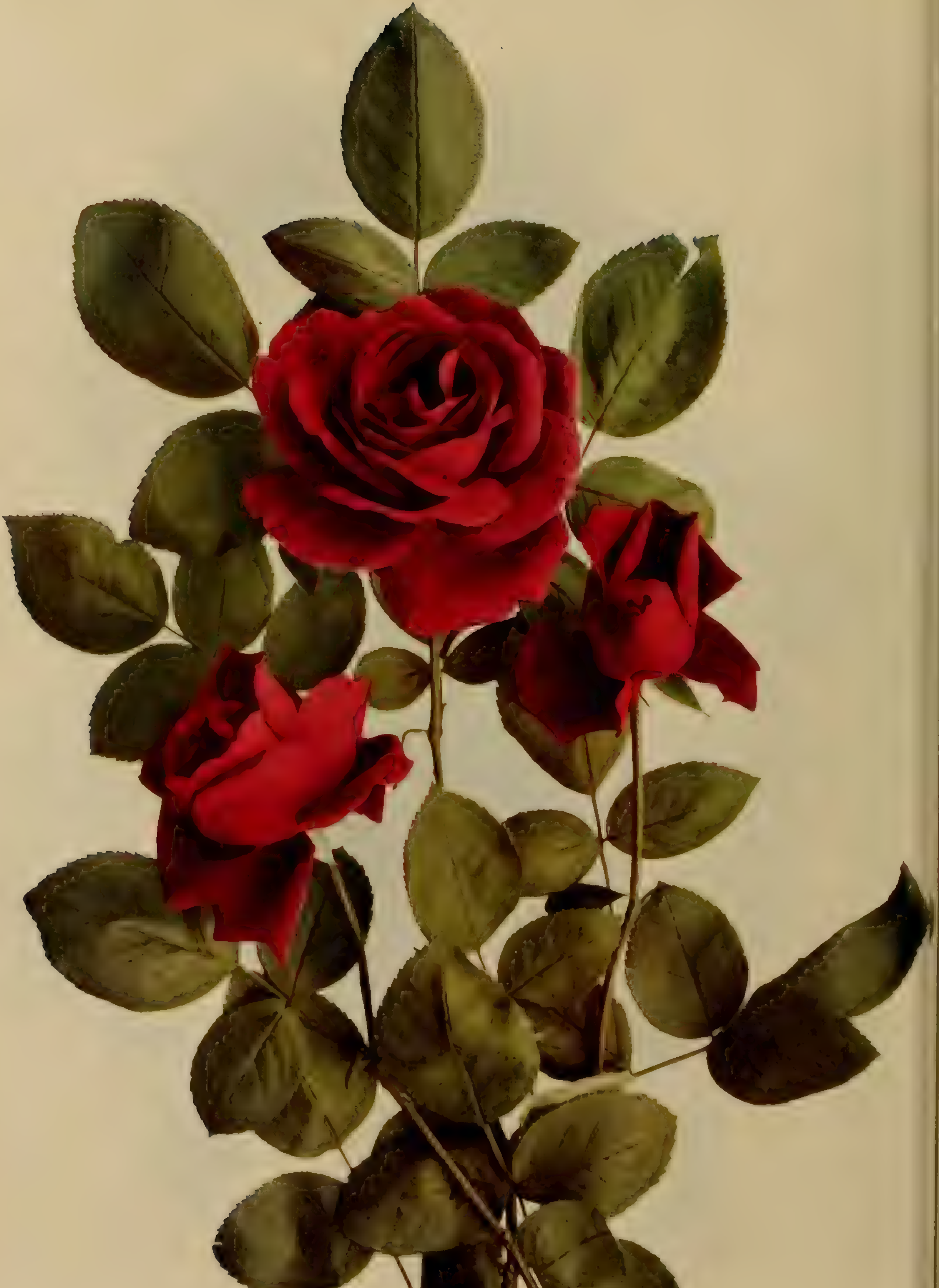
I dwell in a garden of roses;
  My soul is afloat in delight;
The scene, though of earth, seems immortal.
  Such intoxication in sight.

A mass of green leaves for a background—
  A background all sprinkled with glow,
For everywhere is a blossom
  Of ruby, or gold, or of snow.

A garden of stars out of heaven,
  And I in the midst of it all,
Just singing a song of the fancy,
  And chasing the petals that fall.

Then, breathing the scent of the flowers,
  I lie in the shade-cooling noon
And give myself up to the resting
  That comes as a God-given boon.

Willis Edwin Hurd.



LIBERTY ROSES.

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AMERICAN COLORTYPE CO., CHI. & N. Y

THE ROSE.

(*Varions species.*)

The moss-rose that, at fall of dew,
Ere eve its duskier curtain drew,
Was freshly gathered from its stem,
She values as the ruby gem.
—"The Cottage Girl."

There are a number of rose species. All are shrubby and vary from small erect to very tall climbing or twining plants. They belong to the rose family (rosaceae) and represent the family type. In the wild state the flower is generally single, its petals (five in number) forming one circle. Numerous yellow stamens and pistils. Woody stem, branching, with numerous prickles. Leaves alternate, stalked with elongated pointed stipules and from three to seven oval, oblong, serrate leaflets. Flowers showy, variable in color. Fruit (hip) quite large, red color, bearing numerous hairy hard seeds.

The rose has been in cultivation for many centuries. The not over-truthful ancient historian and traveler, Herodotus, reports a rose having sixty leaves, referring undoubtedly to Rosa centifolia. Theophrastus and Plinius also describe this rose, and also refer to a rose of Syria (Rosa moschata), which was said to have been extensively employed in the preparation of cosmetics and salves. Rose petals have been employed medicinally since time immemorial. The petals were macerated in oils or fatty oils or in wine. The leaves and petals were also mixed with honey or sugar. Dioscorides mentions an extract of rose petals and describes the preparation of "rose honey" and "rose pastilles." According to Scribonius Largus (first century, A. D.), rose cerate was much used to apply to the skin following the use of mustard plasters. Rose water is not mentioned until about the close of the thirteenth century. The Arabians cultivated roses on a large scale, for medicinal purposes. The Rosa provincialis, which was evidently from the Orient, was very extensively cultivated in France during the middle ages. The rose oil of the ancients was merely fat perfumed with the rose petals, as explained by Dioscorides.

Rose water was first prepared on a large scale in Persia. In 810-817 the south Persian province Faristan sent an annual tribute of thirty thousand bottles of rose water to Bagdad. From Persia rose water found its way into Arabia and from thence into Europe, first into Spain, then under the Arabian rule. Not only was rose water used as a cosmetic and a medicine, but it was also used in cooking.

Rose oil obtained from the petals was not known until about 1570. At the beginning of the seventeenth century rose oil as well as rose-perfumed oils and fats were introduced into Germany and other European countries. The noted rose oil (otto, attar or ottar of rose) factory at the town of Kazanlik, in the Turkish province Roumelia, was founded in 1600, is still in existence, and produces the finest and most highly-prized rose oil, worth about eight dollars per ounce. The petals yield only about four per cent. of oil, from which it is evident that a large quantity of petals are necessary to yield an ounce of oil. The oil is obtained by distilling the fresh petals. It is a clear, pale yellow, oily liquid. Cold readily solidifies it. Rose oil is also made in England, Germany, United States, India, Asia and other countries. Otto of rose is very frequently adulterated with oil of geranium, which is prepared from a grass of India (Andropogon pachnodes). Spermaceti is also used as an adulterant, besides cheaper grades of rose oil.

The great multitude of cultivated roses are all derived from a few species of wild growing ancestors. In wild growing roses the corollas are simple but under cultivation the stamens and pistils are changed into petals and the flowers become doubled and correspondingly more showy. There are a number of wild growing species in the United States, of which the prairie or climbing rose (Rosa setigera), meadow rose (Rosa blanda) and dog rose (Rosa canina) are the more common. Cultivated roses may be classified as follows, according to stock origin: 1. Climbing roses. To this class belong the above climbing or prairie rose and its derivatives, the Baltimore Belle, Queen of the Prairies, Evergreen, Ayrshire, Musk, many flowered roses, and the host of Banksias. 2. Garden roses which bloom only once each season; the so-called summer or June roses; Scotch roses, burnet rose, cinnamon rose, damask rose, the provins hundred-leaved or cabbage rose (derived from Rosa centifolia), with its numerous varieties, the French or red rose (derived from Rosa gallica), and its numerous varieties. These are all old favorites and will continue to be, though giving way to the following group. 3. The hybrid perpetuals or autumn roses. These blossom a second time each season after a period of rest. These are perhaps mostly derived from the China or Indian rose. (Rosa Indica.) The flowers are large, brilliant, showy. The principal varieties are General Jacqueminot, Baronne Prevost, Giant of Battles, each with a host of sub-varieties. 4. Roses blooming continually. These are mostly derived from the above stocks, and are the product of crossing, cultivation and artificial selection. The principal varieties are the Bourbons and Souvenir de Malmaison, monthly, or Bengal roses, the Noisette race, derived from the musk and tea rose, and which are mostly climbers, tea or tea-scented roses, derived from Rosa Indica var adorata. The large yellow Marchal Niel is by some classed as a tea rose; by others as a noisette.

Varieties are perpetuated by grafting buds or branches on a hardy stock, as the common dog rose. It is best to graft on stocks native in the country in which it is desired to grow the variety. For example, in the United States any one of the wild growing species may be used as a stock plant.

The rose is a national emblem flower of England. It is quite universally recognized as the handsomest of all flowers. The rose signifies love, joy and prosperity. In the song of Solomon the Rose of Sharon is mentioned and allusion is made to the plantation of roses at Jericho. Perhaps no plant or flower has figured more extensively in myth and folk lore. The ancients regarded the rose as the emblem of silence, which accounts for the derivation of the expression sub rosa.

The principal use of the rose is for ornamental culture purpose. The famous rose oil (otto of rose) is used as a perfume. It is also employed for scenting snuff, hair oils, salves and essences. Rose water is extensively used as an addition to gargles, eye washes, skin lotions, etc. The bright red hip is sometimes eaten and also used for decorative purposes. Country school children are in the habit of eating the petals and hips. The hips of the dog rose are used for making a confection. The petals are added to sachet powders.

In the history of England the war of roses was so-called because of the red and white rose badges, respectively, of the houses of Lancaster and York (1455-1485). In France the rose figures in a special church ceremony, known as rose festival, celebrated on June 8.

Albert Schneider.

Vol. XIII. FEBRUARY, 1903. No. 2.

The beautiful is as useful as the useful.—*Victor Hugo.*

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BIRDS AND NATURE

Smithsonian Inst
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EDITED BY WILLIAM KERR HIGLEY.

ILLUSTRATED BY COLOR PHOTOGRAPHY.

$1.50 a Year. 15 Cts. a Copy.

A. W. MUMFORD, Publisher

203 Michigan Ave., Chicago, Ill.

FRANKLIN CO. CHI.

BIRDS AND NATURE

MONTHLY, EXCEPT JULY AND AUGUST.

TERMS AND CONDITIONS OF PUBLICATION:

PRICE. Subscription price is one dollar and fifty cents a year, payable in advance, with 50 assorted pictures, $2.00; single copy, 15 cents.

POSTAGE IS PREPAID by the publisher for all subscriptions in the United States, Canada and Mexico. For all other countries in the Postal Union, add 30 cents for postage.

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BIRDS AND NATURE.

ILLUSTRATED BY COLOR PHOTOGRAPHY.

VOL. XIII. FEBRUARY, 1903. No. 2

WINTER WALKS.

Still there was beauty in my walks; the brook,
Bordered with sparkling frost-work, was as gay
As with its fringe of summer flowers. Afar,
The village with its spires, the path of streams
And dim receding valleys, hid before
By interposing trees, lay visible
Through the bare grove, and my familiar haunts
Seemed new to me. Nor was I slow to come
Among them, when the clouds, from their still skirts,
Had shaken down on earth the feathery snow,
And all was white. The pure keen air abroad,
Albeit it breathed no scent of herb, nor heard
Love-call of bird nor merry hum of bee,
Was not the air of death. Bright mosses crept
Over the spotted trunks, and the close buds,
That lay along the boughs, instinct with life,
Patient, and waiting the soft breath of Spring,
Feared not the piercing spirit of the North.
The snow-bird twittered on the beechen bough,
And 'neath the hemlock, whose thick branches bent
Beneath its bright cold burden, and kept dry
A circle, on the earth, of withered leaves,
The partridge found a shelter. Through the snow
The rabbit sprang away. The lighter track
Of fox, and the raccoon's broad path, were there,
Crossing each other. From his hollow tree
The squirrel was abroad, gathering the nuts
Just fallen, that asked the winter cold and sway
Of winter blast, to shake them from their hold.

WILLIAM CULLEN BRYANT, "A Winter Piece."

THE PINK-SIDED JUNCO.

(*Junco annectens.*)

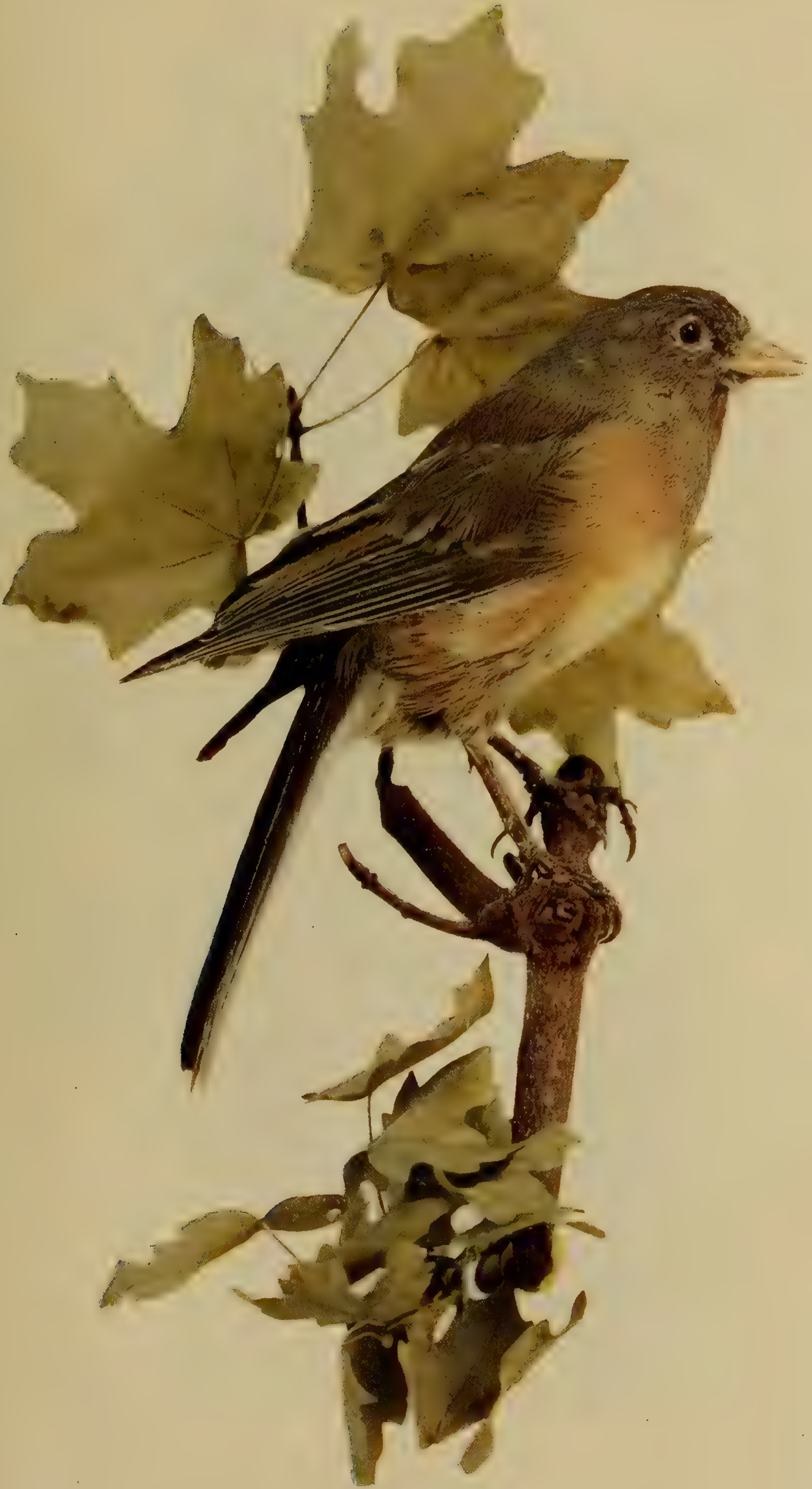
Their sweet disposition and cheerful actions, rather than their song and brilliant colors, make the juncos attractive. These poetical birds appeal to those who love Nature, especially in the grey of fall and winter. Of the slate-colored junco or snowbird the poet as written:

> Then 'mid snowdrifts white,
> Though the trees are bare,
> Comes the snowbird, bold
> In the Winter's cold,
> Quick and round and bright,
> Light he steps across the snow,
> Cares he not for winds that blow,
> Though the sifting snow be drifting
> Through the air.

The juncos are birds of the mountain forests and are driven to the lower altitudes and warmer climates by the severe snows of the mountain regions. Except during the nesting season, they are decidedly gregarious birds and will be seen in flocks varying from a dozen or more to several hundred individuals. Always active, they seem to be constantly moving, either in search of food or in happy play. They chase each other on the ground or in flight, uttering a short note at frequent intervals. "In their homes you find them more interesting than when in flocks, because they are now leading individual lives, but they are still the same trustful, gentle birds, ready to come into camp or to let you examine their nests." During the colder seasons, their food consists of the seeds of weeds and grasses and the crumbs found in the dooryards. In the summer time, however, they destroy a large number of adult insects and their larvæ and eggs. Not infrequently they scratch among the dead leaves of the forest in their search for food. When feeding or resting in flocks, a slight disturbance will cause them to fly, twittering away to some sheltering foliage near by. It will not be long, however, before confidence returns and these social birds will again be feeding upon the ground or they may unite in singing a "sunny, pleasing warble."

The Pink-sided Junco passes the summer season in the Rocky Mountain region of Idaho and Montana, where it makes a home among the pines. It has been found at an elevation of nearly ten thousand feet. Mr. Davie describes a nest that was found at an elevation of eight thousand feet. He says this "nest was under a shelving stone, in a little hollow dug out by the parents. It was rather large and compactly built, composed of coarse, dry grasses and with an inner lining of fine yellow straw and hair of the mountain sheep." It is said that this Junco, when sitting, is very tame and will seldom make a greater demonstration than to utter a quiet note of complaint.

At the approach of winter, these birds retreat before the icy storms of the mountains and the snows that cover the source of their food to the milder climate of Arizona, New Mexico, and Northern Mexico.



FROM COL. CHI. ACAD. SCIENCES.

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PINK-SIDED JUNCO.
(Junco annectens).
Life-size.

THE THREE ONES.

Dr. Miller is very fond of pets and in his office he has three that he calls "The Three Ones." They are Polly, the parrot; Dickie, a canary, and Tootsey, a handsome tiger cat.

"The Three Ones" are the best of friends and afford a great deal of amusement to the people that call at the Doctor's office.

Polly is a great talker and is the most interesting of the three. She knows the names of the canary and the cat and carries on quite a one-sided conversation with them.

"Polly and Dickie are going to Bristol to-day" is a favorite remark of Polly's.

She enjoys hearing Dickie sing and will say, "Dickie, sing for Polly." If the bird does not sing she will say, "Bad Dickie; naughty boy," and put her head under her wing and go to sleep. It makes her very angry if anyone talks or makes a noise when he is singing. "Stop! Hark!" she cries, until the noise ceases. She tries to imitate Dickie's singing, and as her voice is nearly as musical as a fish horn, she only succeeds in making a simpleton of herself.

"Come, Tootsey; come, kitty," and Polly coaxes the cat upon the table where the cage is kept. If Tootsey walks around the cage and her tail happens to slip between the bars, Polly gives it a tweak quick as a flash and the cat gets down from the table in a hurry. Polly will be so pleased at her little joke that she gives what Dr. Miller calls "a regular fat man's laugh."

One might think that Tootsey would profit by the experience, but she does not. She is of a trusting nature and the next time Polly calls her in a wheedling tone, she jumps upon the table as readily as before.

Polly will cry, "Hello, Central! Hello! Hello!" in exact imitation of the Doctor's voice, but what pleases him most is when she cries in the tone of angry impatience that he uses when he cannot get central.

There is generally plenty of fun when Dr. Miller lets Polly and Dickie out of their cages. Tootsey is very jealous of them then and does not like to have the Doctor pet them. Dickie is so tame that he will fly upon the Doctor's shoulder or upon his finger if he holds it out.

Polly will chase Tootsey all around the office, screaming at the top of her voice. Every piece of paper she gets hold of, she tears into bits and she usually makes such a litter that the Doctor is glad to get her back into the cage again.

Dr. Miller once had an elderly lady in charge of his office. She was very fond of tea and would often express a wish for a cup of the beverage. The lady was surprised one day at hearing Polly say, "How I would like a good cup of tea!" The parrot imitates the tone as well as the words she hears used and for this reason is all the more amusing.

One day a man suffering with a terrible headache came to the office. The Doctor was not in, but was expected any minute, so the man waited for him. His head pained him so badly that he could not help groaning, and would cry, "Oh, how my head aches! Jerusalem; how it does ache!" and he would hold his hand to his head and groan. Polly heard this repeated so often that by the time the Doctor returned she had it to perfection, and now repeats it quite frequently. She does not forget to put in the groans, and to hear her a stranger might well believe that she was dying with pain.

Sometimes Polly will talk and scold all day, crying "Polly's a good girl to-day. Polly's good. Good Polly. Let

Polly out. Polly's a good girl. Let Polly out." The next day she may not say a word but sit with her head under her wing.

As soon as Polly sees a person put on his hat she will say, "Good-bye. Good-bye."

Occasionally one of the Doctor's callers will put a finger into Polly's cage, but he never tries it a second time. The parrot does not like such familiarity from strangers, and is very apt to take out quite a piece of flesh from the finger.

This has made enemies for Polly, and the Doctor has also felt the displeasure of a number of his patients. He has been advised to take Polly out of the office, but he says he is not going to take away the mainstay of "The Three Ones" just because people don't know enough to keep their fingers out of Polly's cage; so as yet there has been no separation of "The Three Ones."

MARTHA R. FITCH.

THE BIOGRAPHY OF A CANARY BIRD.

"Bobbie" was hatched some ten years ago in a farm house kitchen, and was cared for by the farm wife until he reached the age of a year or more.

He was noted from his earliest birdhood for being a homely, bronze, mixed-up canary, of extremely inquiring and sagacious disposition, always poking his bill into everything that came his way and always ready to take his food from his mistress' hand.

I think it was this pert way that took my childish fancy when selecting a pet from among the flock of little fluffy, pale yellow fellows that were said by the "Mrs." to be superior birds.

Bobbie, for so he was named, won my affections at once, and held them for the rest of his rather long life.

Given a cage by himself, he proceeded to adapt himself at once to his new surroundings and it seemed from the first of his new life, that he recognized the wealth of love that was lavished upon him by myself and eventually by every member of the family who, at first, were rather inclined to be a little sarcastic about the way I talked to "just a canary bird."

Bobbie thrived on ordinary canary diet, but preferred eating from my hand or from my mouth. Many a cunning caper he cut, trying to secure the coveted food from my lips, when tightly held in order to provoke his birdship, which was quite easily done.

He would come to the side of the cage at my whistle, or call—he knew both—and would drop his wings and perk his head from one side to the other and chatter as if he perfectly understood my every tone, which I fully believe he did. Such a burst of song as would greet me after a little absence from our living room, which was Bobbie's home also. When I was gone all day at school, he never failed to note my absence, by fretfulness in the morning for a half hour or so. His plantive "ch-ee-p ch-ee-p" was what led other members of the family to talk to him, and he in time grew quite familiar with all, though he was very much afraid of strangers. When the time came for me to attend college, the question arose, "What will you do with 'Bobbie?'" "Why, take him along, of course," and to college we went, Bobbie and I.

"The new girl who brought her bird along" was quite a person in the estimation of some people who thought such a thing quite babyish; but we did not care

—Bobbie and I. We had good times together, and after a while, the girls who called, discovered him to be quite as interesting as I thought him; and the way he would "talk back" to them when they teased him, was something remarkable.

The following conversation is but a fair sample of daily occurrences:

"Hello, Bob!"

"Che-ee-p, Cheep!"

"Hello, old sassy!"

"Chee-p! Che-ep!" (with dropped wings).

"Want some candy?" (tauntingly held up).

"Zeep, zeep, zeep, zeep" (with flashing eyes—and who says a canary's eyes can't flash fire when aroused?).

"Oh, don't get so gay or you won't get a bite!"

"Squeak! Squawk!!" (in as discordant tone as bird could possibly utter).

"Oh, Bobbie, don't get so angry!" (in mocking voice).

"Zett, zeet, zett, zett, zett, zett" (with swelling breast, ruffled feathers, beating wings till the little body would almost burst with excitement). Perhaps this outburst would be followed with something not quite satisfactory to his somewhat fastidious taste; then looking about for me, he would call "ch-e-ep" in wonderfully touching tones with such an injured air.

The college girls soon knew Bobbie, and many pleasant hours were whiled away with this little bundle of animation. Strange all the teasing he received never spoiled his temper. It only made him more confidential.

He was a particular favorite of the family with whom I roomed, Mr. Smith often remarking, "Well, I never knew that a bird could know so much." A favorite game with Mr. Smith was to give Bobbie the freedom of the room, and then big, fat Mr. Smith would go down on the floor on all fours with a broom splint, and Bobbie would chase the splint from one side of the parlor to the other as a kitten might. Such a comical sight! I could carry Bobbie on my hands out of doors across to a neighbor's house, with perfect freedom. He flew into an apple tree one morning. He stayed about an hour, but came back, and seemed pleased to know he was in his cage again.

When I turned him loose in the room, a particular prank which he loved to play was to light on some one's head, and unexpectedly give them a peck. This was oftenest played on a gray-haired lady who lived in the house, and who was quite a favorite with Bobbie. He would rest on her head, pull up the strands of hair and when she would put up her hand, he would smartly peck her fingers.

Some times when several were talking, Bobbie was not contented to be "seen," but wanted very much to be "heard," which was not always convenient for the speakers.

A cloth or shawl flung over the cage had the effect of lowering the song to a mere whisper, but failed to stop it. Often in the evening when callers came in he would sleepily pull his head out from under his wing, sing a very sleepy strain and then go to sleep again.

This very interesting pet lived to be seven years old. After the excitement of college life he was taken home, but he soon grew feeble and one bright summer morning, I hung his cage in the sunshine, and going out a short time after, found that his little life was finished and Bobbie was no more. All that remained of him was carefully buried, but no pet I have since had has shown the love or given evidence of knowing as much as did my ugly little mongrel, Bobbie.

MARY NOLAND.

FALLING RAIN.

Ere the spring cometh
Gentle and mild,
While the wind bloweth
Rudely and wild,
From the dull cloud line
Dark o'er the main,
Sharp as an arrow,
Falleth the rain.

Dreary, oh dreary,
Is all around;
Leafless the woodland,
Sodden the ground.
Streams hasten onward,
Sweeping along,
Murmuring hoarsely
Winter's dull song.

When the spring cometh,
Pleasant and fair,
When the clouds silver gray
Float in the air.
While the blade springeth
Upward again,
Midst golden sunbeams,
Falleth the rain.

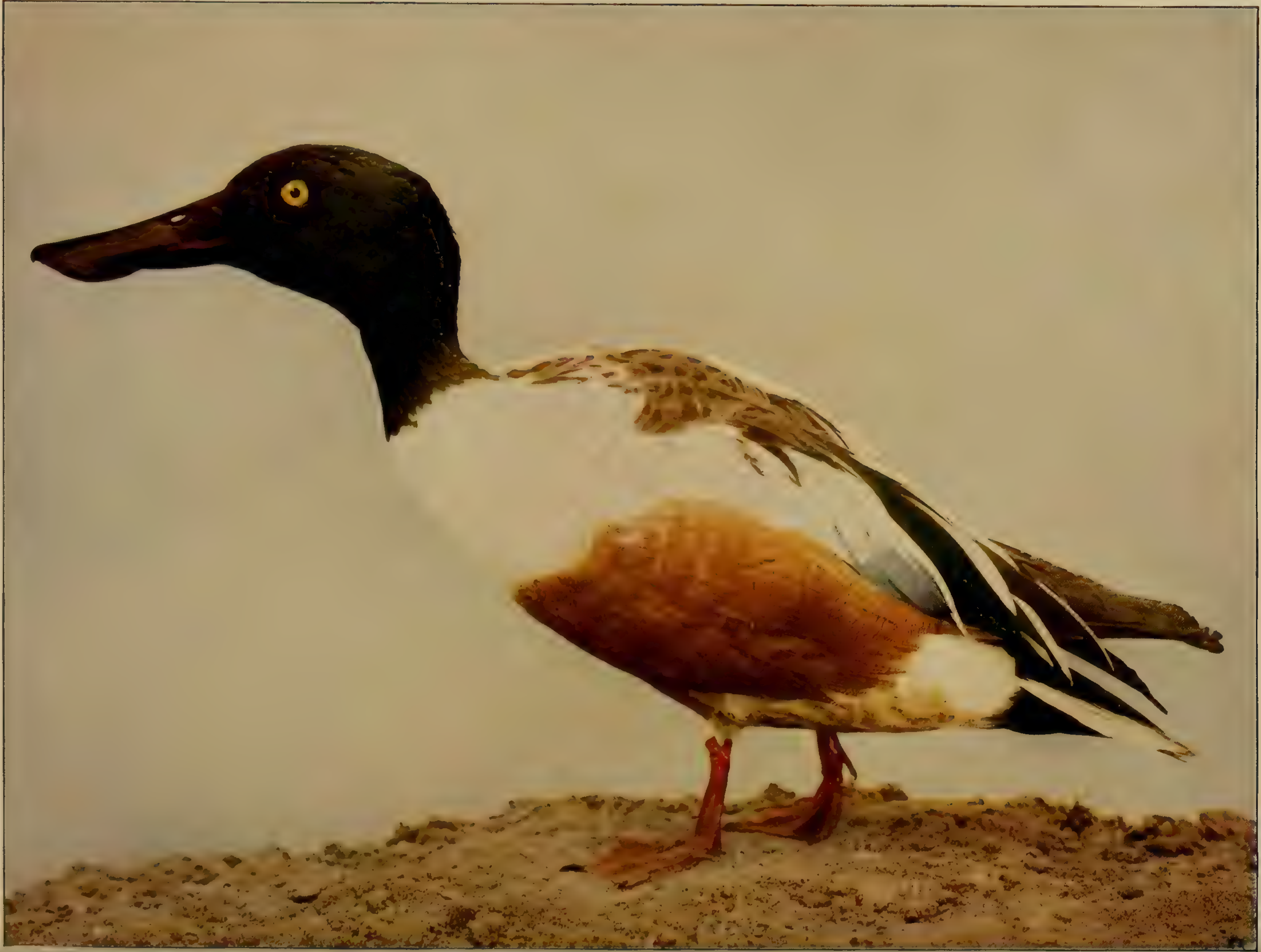
Like tears in childhood
Soon wiped away,
Brief thoughts of sorrow
Soon lost in play;
So, in the spring-time,
In the green lane,
While hedges blossom,
Falleth the rain.

While the long summer
Parches the ground,
While droop the flowers
Sadly around;
O, then, how pleasantly
Once more again
From the dimmed heaven
Falleth the rain.

When golden Autumn-days
Once more have fled,
When all their treasures are
Dying or dead,
When all earth's glories
Day by day wane,
O, then, how gloomily
Falleth the rain.

Like tears in bitterness
Shed by the old,
When life's light fadeth
And joys grow cold,
When they no longer
Here may remain,
Mournfully, mournfully,
Falleth the rain.

BELLE A. HITCHCOCK.



FROM COL. CHI. ACAD. SCIENCES.

THE SHOVELLER DUCK.

(*Spatula clypeata.*)

The Shoveller or Spoonbill Duck is a bird of wide distribution, inhabiting all the continents of the globe and breeding in the northern portions of both hemispheres. It is a bird of remarkable individuality. It belongs to the pond and river ducks, all of which group are more abundant about fresh water than along the sea coast. On this continent it retires during the months of May and June to the lakes and marshes, chiefly those of the interior, where it builds its nest and rears its young.

It is a common summer resident of Minnesota and the Dakotas, thence it ranges northward through Manitoba, Assiniboia and Alberta, Canada. Formerly it was a common inhabitant of the British Isles, in the fen districts of Norfolk, Scotland and Ireland, but there it is gradually becoming scarcer. During their semi-annual passage through Illinois small flocks of Shovellers are frequently met with on the Illinois and Kankakee Rivers and on Lake Calumet. Usually they arrive from the South in March and by April the majority have paired, at which time they usually move northward, and the northern tier of states, with few exceptions, is the southern limit of their breeding range. In September and October its southern migration takes place and it flies to its winter home in the southern states, although in mild seasons a few may winter further north. This Duck is not infrequently met with in Cuba and South America during the months of December and January.

Though nearly cosmopolitan in its range, the Shoveller lacks the popularity which many of our ducks possess. Sportsmen do not look upon it with the same pride that they feel for a "bag" of canvasbacks, or teal; yet the flesh of the Spoonbill is considered delicious by some epicures, who are extremely fond of game.

The drake is a handsome bird, with head and neck dark glossy green and a yellow iris. The bill is black, and the white of the breast gradually shades into chestnut on the belly. The tail is short and pointed. The wing coverts are blue and the speculum is green, bordered by white. The feet are bright orange or vermillion in color. The female has colors more or less characteristic of other species of other ducks of the same sex, especially the mallard. This is pale brown or brownish, mottled and streaked with dark brown and black. On the under part the markings are more in the form of spots and specks, while the coloring of the eyes, wings and feet are not unlike those of the male. The bill is lighter, being brown, with orange on the sides.

An immature mounted specimen in my collection is speckled and mottled about the head, neck and breast, with colors intermediate between the adult of both sexes. In beauty it is almost equal to a fully plumaged drake.

The bill of this bird is a remarkable organ. It broadens at the ends until it exceeds twice the width of the base and assumes a shape not unlike an ordinary spoon. Such a peculiarity readily distinguishes the Shoveller from all other species of the duck tribe.

When disturbed or alarmed, the drake utters a peculiar noise which might be compared to the sound produced by a person when repeating the word "duck" several times without separating the jaws.

A female's note bears a resemblance to that of the mallard, an oft repeated "quack."

Gerard Alan Abbott.

IMPERVIOUS.

"How hoarse you are!" the wild duck said,
  "You've got your feet wet in the channel;
You're only fit to go to bed
  And have your throat wrapp'd up in flannel."

"Tut, tut!" replied the drake; "in truth
  There's no occasion for these qualms, dear:
The Corncraik's hoarser far; in youth
  He spoilt his voice with singing psalms, dear."

"That's more than ever you did," cried
  The angry Duck; "it's most provoking
To such a creature to be tied:
  I know your feet are simply soaking."

The season'd Mallard softly laid
  His bill among his shoulder-feathers,
Serenely shut his eyes, and paid
  No more attention to her blethers.

HENRY JOHNSTONE.

SANCHO'S PROTEGE.

I want to tell you something about our cat, Sancho Panza. He was a noble animal and we thought him very smart and bright. He had a way of opening the doors which, although it afforded us some amusement, was sometimes a source of annoyance. One fall a neighboring family, on leaving for their city home, left behind a kitten which for some reason did not stay at the house of the man having charge of our neighbor's place, but wandered to our premises. Another neighbor had a cat which was around our yard a large part of the time and which was accustomed to fight the kitten until life was rather a burden to her. She finally put herself under Sancho's protection and he became her champion. One morning, after breakfast, he went out leaving some milk in his dish by the kitchen stove. After awhile the outside door opened and in walked Sancho, the kitten following after him. He waited upon her to his dish of milk with as much politeness as I ever saw a gentleman show toward a lady, stepping one side and waiting while she disposed of the milk. Then they both went out. Of course he had communicated with the kitten in some way, else how could it all have happened?

MARY ELLEN PERLEY.

WINTER BOARDERS.

A few feet from my kitchen, the tips of its branches almost touching the window, is a wide spreading apple tree. In May, it is a delight with its burden of fragrant blossoms. In summer the great "August Sweeties" are welcomed by the little people, and in winter its branches are a favorite resort for the birds.

Learning that our winter birds are fond of fat, I tied some bits of suet to the branches. A half dozen chikadees soon discovered the treat and came every day as long as the cold weather lasted. No matter how cold the day, their soft little cheep-cheep or cheerful dee-dee-ah-dee-dee-chick-a-dee-dee-dee announced their presence.

I came to love them, and in a little while they seemed to know me and became as tame as a flock of chickens.

I fastened a piece of uncooked fat meat with a long slender wire nail to the window casing. The end of the nail made a convenient perch and the little creatures would sit upon it, looking in at me at my work, no doubt wondering what sort of person I was. They were too restless to stay in one place long at a time; they seemed to have discovered the secret of perpetual motion. I never could count but six of them in my tree but they flitted about so incessantly that it seemed as though there were a great many of them.

My next guest was a small black and white wood-pecker; as he always came alone I dubbed him "The Old Bachelor." I usually saw him first on the trunk of the tree. He almost invariably ascended the tree from left to right, running up in a series of short quick steps. If he wished to go lower he made short flights, never walking down. He was always on the elert for danger, seeming to expect an enemy after each "peck." If he had any song or call he never gave it in my hearing.

The next to arrive was a jolly blue jay. He always announced himself by his harsh cry, calling his name. He usually came alone, but occasionally Mrs. Jay would come to the pear trees a few yards away. He would swell and call and seem to try to encourage her to come to the feast, but she never dared venture. He was very greedy and I usually had to replenish the larder after his visits for after he had eaten all he could, he would fly away with a great beak full, no doubt putting it in store "for a rainy day."

He paid no attention to the smaller birds and they took no notice of him. An empty robin's nest, he investigated thoroughly.

The next to come were a pair of nut-hatches. I, at first, supposed them to belong to the wood-pecker family on account of their short tails and manner of running up the trunk of the tree. I soon noticed that they ran down as well as up the tree, and that they were fond of crumbs as well as of fat and insects. Their bills were also very slender. I never heard either of them utter a note. These were the last of my "Winter Boarders."

BERTHA HORNE ALLEN.

THE REDPOLL

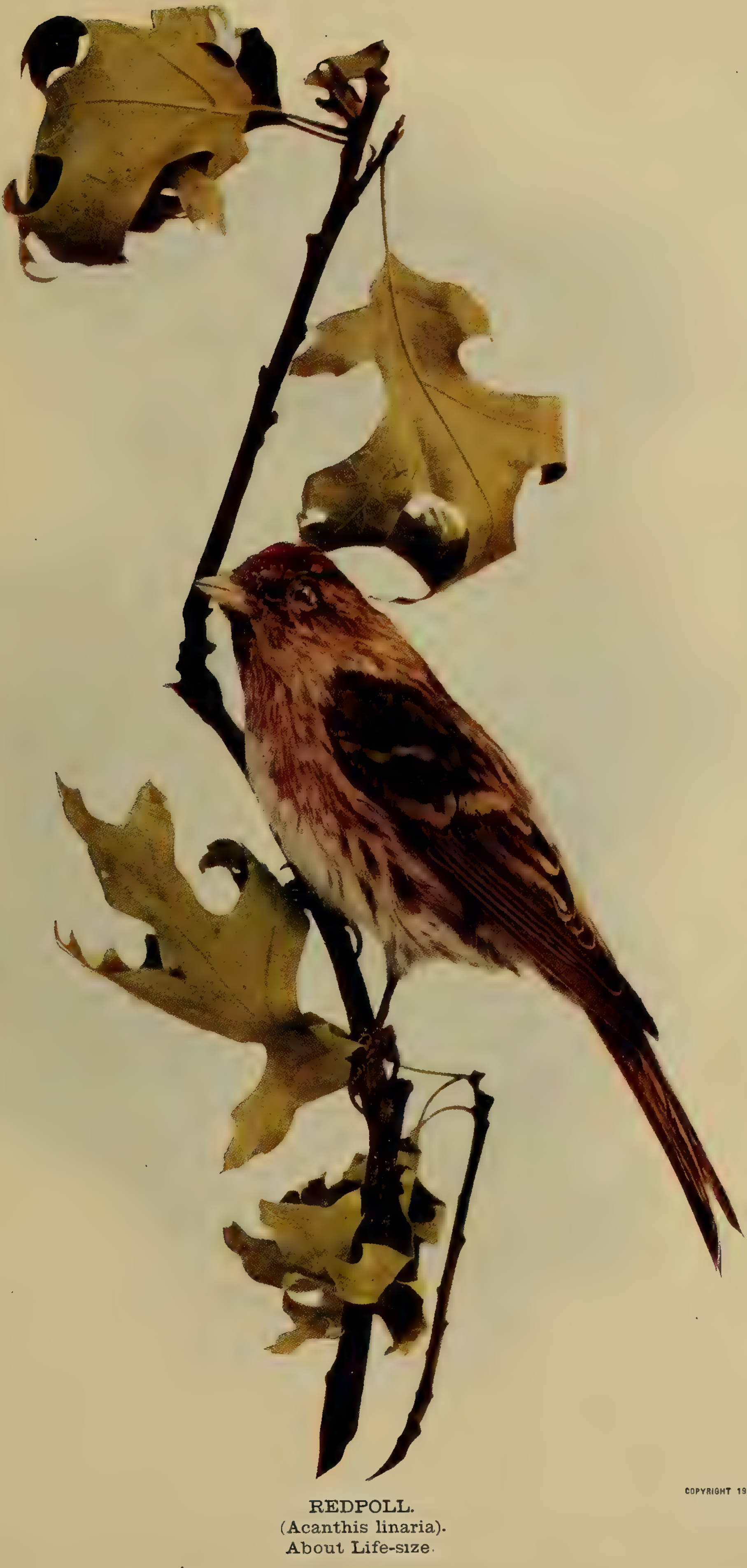
(*Acanthis linaria.*)

In the birches, on the grasses
Stiffly rising through the snow crust,
On the slope of yonder sand-bank
Where the snow has slipped and wasted,
Rest a flock of trustful strangers,
Lisping words of gentle greeting,
Rest and find the sun's rays warming,
Rest and find their food abundant,
Resting, sing of weary journeys
From a Northland cold and distant.
—Frank Bolles, "The Redpoll Linnet."

It is extremely doubtful if the beautiful little Redpoll would ever be more than a casual visitor in the United States, were it not for the lack of food during the severe winter seasons in the far North. It delights in the cool air of high latitudes and it has been known to remain at high attitudes on mountain sides when the thermometer registered a temperature near thirty degrees below zero. During the winter the Redpolls are common in Colorado from the plains to a height of ten thousand feet. In Alaska, Mr. Nelson says that they leave the coast late in the fall and "flock to the interior, where they brave the severest weather."

This beautiful bird with its "bright rosy hues and fluffy plumage;" its cheerful and confiding nature, and its activity and curiosity, becomes an interesting study, when, after the young have passed from its care, it approaches gardens and houses, seeking food. It carefully examines everything, "scarcely deigning to move aside as the people pass back and forth." In some localities the Redpoll seem to take possession of every available spot. The roofs of building, the vines on porches, the rails and posts of fences, and the trees and bushes that shade the lawn, all seem available as perches upon which they rest or launch forth in quest of food or to chase their fellows in happy play. The simplicity and happy disposition of the Redpoll is almost childlike. Mr. Burroughs observed this species in company with the Canada sparrows, about a barn yard where it fed through the winter on the scattered hayseed. He says: "I felt grateful to them for their company. They gave a sort of ornithological air to every errand I had to the barn."

Mr. Selby gives the following account of the habits of the Redpoll, as he observed them in England. "It is only known in the southern parts of Britain as a winter visitant; and it is at that time gregarious and frequently taken, in company with other species, by bird-catchers, by whom it is called the Stone Redpoll. In the northern counties of England and in Scotland and its isles, it is resident throughout the year. It retires during the summer to the underwood that covers the bases of many of our mountains and hills and that often fringes the banks of their precipitous streams; in which sequested situations it breeds. The nest is built in a bush or low tree, of moss and the stalks of dry grass intermixed with down from the catkin of the willow, which also forms the lining and renders it a particularly soft and warm receptacle for the eggs and young." The materials used in the construction of the nests vary with the locality selected and the kind of materials usually found in the immediate



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REDPOLL.
(Acanthis linaria).
About Life-size.

vicinity are used. Occasionally the nest is built in a tall tuft of coarse grass.

In North America this affectionate little associate of the junco, tree sparrow and sometimes of the crossbill has a number of common names. Some of them are, the Redpoll Linnet, the Red-capped Chippy, the Dusky Redpoll and Snowbird. Its habits are similar to those of the goldfinch. Its note is uttered while flying.

The Redpoll is easily tamed and has been taught to perform tricks. Mr. Langille writes of an interesting instance, that came under his observation, of several Redpolls in captivity. He says: "One had a soft belt around his body, under his wings, to which was fastened a small chain and a bucket about as big as a thimble, with which he drew water out of a deep dish and drank. Another had a tiny car on a platform outside the cage, and as this little vehicle was fastened to the inside of the cage by a chain and contained his food, he would draw it in whenever he wished a repast."

SNOW BUNTINGS.

Tawny coats and white we wear,
Whirl and waver to and fro
In our flight, and fill the air
With our music as we go.

Fairies are we, fairy-bells
Sound for us to time our play;
Now the rippling measure swells,
Now it sinks and dies away.

Ever as we rise on wing,
Wavering, whirling far and near,
All our bells begin to ring
In a merry chime and clear.

Sweet and silvery is the sound
Of the tinkling notes they pour,
Ringing, ringing round and round,
Chiming, chiming o'er and o'er.

Strangers from the Land of Snow,
Here we sojourn till the spring
Calls us hence, and northward ho!
Back we ply on merry wing.

HENRY JOHNSTONE.

TRUE ANECDOTE OF A HEN.

She was a beautiful looking fowl, with black, satiny feathers that shone in the sun like burnished steel, and the bright red comb she always wore, gave her a genteel air. Still she did not do her duty as a hen; she never—so far as we knew—laid an egg, and then exultingly told the "yard" of it; and, she never did any scratching for a brood of downy little chicks, although she often pretended to, and if any one admired her, she seemed very proud. When one never does anything for others and only cares to be admired and praised, people get very tired of having that one about; so the black hen was given away.

Now the little woman to whom she was sent, had neither children nor pets of any kind and her great heart was full of love for every living thing. So finding the hen very tame, she often spent much time stroking the beautiful shiny feathers. "Biddy" was in her glory, and soon became a pampered darling. She walked in and out the house at will and followed the little woman about in her work very much as a cat would have done.

When her mistress rested in the rocking-chair at noon, the little hen would walk sedately to her side, and with a low, soft "cluck" jump into the comfortable lap where she was sure of a welcome, and she thoroughly enjoyed the caresses lavished upon her. As the fall and winter nights came on, a perch was made in one corner of the kitchen, "Biddy's carpet" spread on the floor and no fowl ever had a warmer, safer roost.

Now it happened that a member of the family, who, during the winter evenings earned quite a little mending the neighbor's clocks, brought one home to repair. It had a large mahogany case, the lower half of the door holding a mirror. During the day this clock set on the floor at one side of the kitchen, and it had not been there long before it was thoroughly investigated by the little hen. At the first sight of her reflection, all her feathers rose and jealousy and indignation flashed from her eyes. She gave a tweak at the glass, but no feathers flew from that other bird as was expected. First on one side, then on the other, cocked the little black head. A few steps this way, then that, and gradually she understood that it was her beautiful self she was gazing at. With such an air of gratified vanity she turned her head then picked at a feather or two. looking into the glass in a very self-satisfied manner. This grew to be a daily occupation, and ofter she was seen to "prink" by the hour. One day, it so happened that the clock was turned with its face to the wall. In great distress "Biddy" scolded and fussed, ran from one side to the other, and not being able to find her beloved mirror, ran into the next room and tugged so hard at the little womans' dress that she was obliged to stop in her baking, find out the cause of the excitement and then turn the clock around. Biddy then complaisantly took her place before it and began the usual prinking.

Harriet Cammett Shaw.

A REMARKABLE DOG.

"Mike" belonged to a blind man who was daily seen on the streets of Wichita, Kansas, a year ago. He was just an ordinary-looking, medium-sized black dog; but he exhibited so much sense that he soon became an object of much attention to the frequenters of Douglass avenue and Main street. There is only one pump on the avenue—a relic of early days. Mike found this pump and led his master to it every morning. The blind man filled a canteen with water for his supply through the day. This done, Mike led him down the avenue until some busy corner was reached. Here the blind man seated himself and made the air ring with the discordant notes of an old accordion. Mike, in the meanwhile, lay down in some chosen place not far away, and—to all appearances—was soon sound asleep. At the sound of his master's whistle, however, he was always ready for business. Occasionally, the old man gave him a little tin bucket, and this Mike would carry up and down the block, wherever he saw a group congregated. If no attention was paid to him, he would pass quietly by; but if a man made a move of his hand toward his pocket, Mike stayed right there until a coin was put into the bucket.

Sometimes after making his round he placed the bucket on the sidewalk and lay down beside it. Of course a crowd soon gathered, waiting to see what the dog's next move would be. When quite a number had collected Mike would get up and pass the bucket again!

One day Mike led his master to the corner of Douglass avenue and Main street. This is the place where all the trolley lines of the city center, coming from eight directions every fifteen minutes. Beside the cars, there is a continual stream of traffic surging up and down the two streets, with automobiles and bicycles to add to the danger of crossing. Wise old Mike brought his master to the northeast corner of the two streets, and waited until all the cars had left and the streets were comparatively clear; then he started to lead the way across. A strong wind was blowing, and when half way over, the blind man's hat was snatched from his head, and sent rolling up Main street. Mike led his master across all the car tracks; then, as the man dropped his strap, he left him standing on the crossing and chased after the hat. It took some time for the dog to catch it, bnt finally he placed one paw upon it, then caught the rim carefully in his teeth. Bounding to where he had left his master the faithful dog sprang up and placed his paws on the man's breast, holding up the hat between his teeth until the man found both it and the strap attached to Mike's collar. Then Mike led the way across the remainder of the street, and placed the blind man on the busiest corner in town.

A young man on a West Side car, who witnessed the affair, exclaimed: "That dog has more sense than some people have!" And his comrade answered him: "That's what he has. I would like to own him."

MARY McCREA CULTER.

THE WHIPPOORWILLS.

From the first of May I had heard the whippoorwill calling from the wood at early evening, but one day as I was walking through a pasture not far from our place a large, mottled brown, grey and white bird flew up from among the daisies. At first it fluttered about very near the ground, as if injured, and then settled on a rock, with its long pointed wings outspread. When I went to the place from which the bird had flown, this is what I saw:

A bare, flat rock, without a stick or a straw, and in a little hollow two creamy white eggs, spotted with brown and purple, and about as large as those of a pigeon.

By this time the mother bird was really alarmed, and, flying to a nearby tree, began to make a harsh noise, like the grating of pieces of wood. This called the male, who sailed round and round, far overhead, making a similar, but louder and fiercer noise. At times he would dart toward the earth as if to attack me, then rise again, calling louder than before. When I told my friends about the birds some said I had found a nighthawk's nest; others that the male was the whipporwill and the female the nighthawk. So I looked the matter up in three reliable works on ornithology, and found that the nighthawk is another bird although very similar to the whippoorwill in appearance and habits. Some of their differing characteristics are the conspicuous white spots on the wings of the nighthawk and booming noise it makes when flying. My birds were whippoorwills.

After this I went nearly every day to the nest and the mother bird, finding that I did not intend to disturb her, sat on the eggs as if asleep, while the male, not so confident of my innocence, sailed watchfully above.

But at night he was not so hostile, for he came to a tree quite near the house, and, in his clear, melancholy notes, called whip-poor-will, whip-poor-will, for hours. Sometimes in the early evening a catbird from the shrubbery, trying to imitate him, would call poor-will, poor-will.

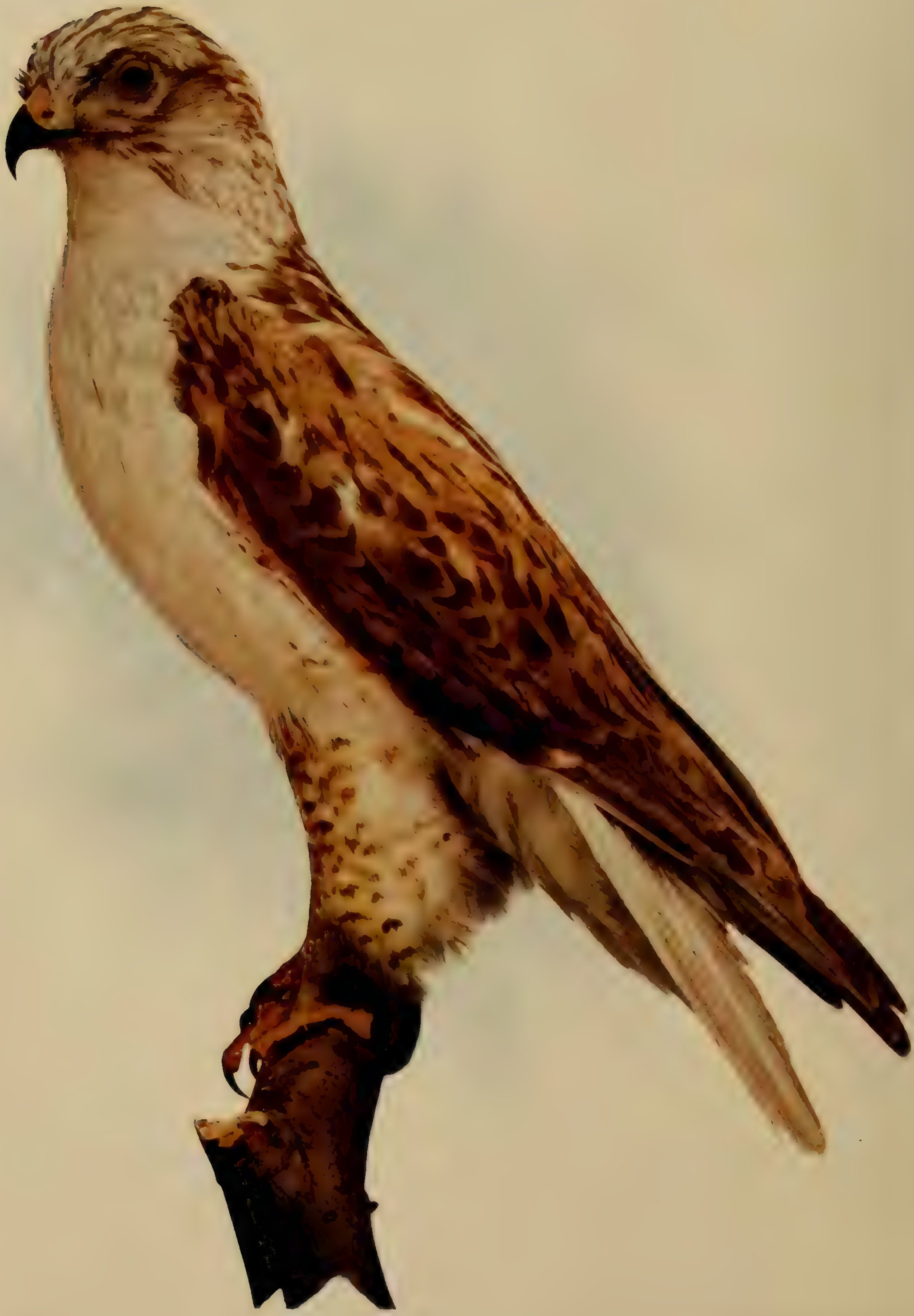
When the patient mother had been sitting on the eggs for two weeks, moving them about a little from day to day, I found one morning two little downy yellow and gray mottled beings, and two broken egg shells on the stone.

They were not scrawny and featherless, as are so many young birds, but their flat bodies were well coveerd with feathers.

It was a long time before I found out what the baby whippoorwills were fed on. They never seemed to be hungry, and, although they came up timidly and looked in when I held out my hand, they would neither eat the bread crumbs or cherries. But in the late afternoon the parent birds could be found catching flies as they sailed through the air close to the ground. In September we missed the evening call and knew that we should not hear it again until the violets came in the spring.

Ella Ursula Hayden.

Loud and sudden and near the notes of a whippoorwill sounded
Like a flute in the woods; and anon, through the neighboring thickets,
Farther and farther away it floated and dropped into silence.
—Henry Wadsworth Longfellow, "Evangeline."



FROM COL. CHI. ACAD. SCIENCES

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FERRUGINOUS ROUGH-LEGGED HAWK
(Archibuteo ferrugineus).
About ¼ Life-size.

THE FERRUGINOUS ROUGH-LEGGED HAWK.

(*Archibuteo ferrugineus.*)

The poise of the larger hawks as they perch upon the bare limb of a large tree is wonderfully beautiful. Not less attractive is their flight as they gracefully sail in circles high in the air or move forward by measured strokes of their strong wings. The graceful movements of these birds seem all the more interesting now that it is known that nearly all the hawks are a positive benefit to mankind. Especially is this true of the one we illustrate. It is the Ferruginous Rough-leg of Western North America. Its range extends from the Saskatchewan southward into Northern Mexico, and from the Pacific coast eastward across the Great Plains and, in the south, to Texas.

This large and handsome Hawk is an inhabitant of the prairie country west of the Mississippi river where it finds an abundant supply of the smaller rodents which form its chief article of diet. In fact, its feeds to such an extent on the ground squirrels that in many localities it is called the Squirrel Hawk. Dr. Coues found in the stomachs of those that he examined the remains of burrowing pouched rats, the western wood mouse, the kangaroo mice and of other rodents. To a limited extent it also feeds upon grasshoppers and other insects, but never attacks birds.

When hunting, it either stands on the ground of the open prairie or skims over the surface in a labored and heavy flight. However, when it circles "high in the air its flight is graceful and resembles closely that of the golden eagle. In fact, in parts of the west it is known by the name Eagle."

Regarding its home, Mr. Fisher says: "The nest is usually built in a tree at no great distance above the ground, but when trees are not available it is placed on the shelves of some of the earth cliffs which abound in certain parts of the west. Like that of the other larger hawks, it is composed of good-sized sticks and coarse herbage of one kind or another and is lined with softer material than the bulk of the structure is composed of. When such things existed on the plains, the ribs and smaller bones of the buffalo were used in the construction of the nest, often forming a large part of it. The eggs, which are usually three or four in number, are deposited in May, and by the middle of July the young are ready to leave the nest. Another authority states that some of the nests of this Hawk, that he examined, were not only lined with weed, sticks and dry grasses, but also with "small pieces of dry turf, which the birds must have pulled or dug up with a great deal of labor, as the sod was very tough."

Dr. Coues very justly calls this bird the "handsomest of the North American Falconidae."

When in flight, or at rest, it is readily distinguished from the more common American rough-legged hawk by the pure white of the plumage on the underside of the body.

THE UNFINISHED STORY.

I'm sure I can't imagine why they call me a Catbird. My real name is Mimus Carolinensis, and you can see how annoying it is, with such a really genteel name as mine, to hear myself called Catbird, after a wretched animal I detest and abhor. Why, I loathe cats so that I shudder when even I see one. What's that? I'm afraid? Ha, ha! Ho, ho; I'm laughing now you understand. I'm laughing because the idea of my being afraid is so very droll. Afraid! Why, do you know what a cow is? A cow is a monstrous animal with glaring eyes as big as my nest, and terrible sharp sticks growing from its head. It has a tail like a corn stalk that it lashes in a most frightful manner, and it has a mouth as big as the chickens' water pan, and it raises its head and gives awful roars. But I? I walk boldly up to it and look right into those fierce eyes, and pick up bits of meal from under those sharp sticks even. Me afraid! Well! Well! It is so amusing!

And do you know what a horse is? A horse is ten million times larger than I am,—Can I tell how much a million is, do you ask? Well, not exactly; I think people who know things exactly are very dull, don't you? But I know a million is more than the eggs in my nest, and I know it isn't as many as the stars in the sky, and that's quite near enough for anyone. Now what was I saying? A horse, oh yes. And it has huge white teeth as big around as my neck, and as long as my wing, and it has four dreadful feet with great stones at the ends of them. But I? I do not run out of its path. I walk slowly when I see it coming, and I even light on its very back. That, I suppose, you can hardly believe, because you cannot imagine any one so brave as I. What do you say? I'm a boaster? Dear me, I haven't the least idea of what you mean; I never heard of it before in my life, but unless it is something very respectable it can't possibly refer to me, for few birds in the world have blood as good as mine. Some of my ancestors saw the Mayflower and brushed their wings against its sails, and one of my ancestors found death under the reign of a Danish king. I do not remember precisely how he found it. It was a long time ago, and there were some quite painful circumstances connected with the affair I believe, but in any case it is something to be very proud and grand over, and so we all have been ever since.

Why, one day in my garden,—and that reminds me of what I started to say. Where I live,—I can't quite recall the name; Geography always made me ill—I think it usually does remarkable people, don't you? But this place is near a big city, and there are mountains back of the city, and the sun shines much there and the snow never comes. Now I am sure you can tell exactly where it is, and if you can't, it is certainly not My fault.

It is that garden with the high cypress hedge around it, and the tall pine by the house, and the twig way on top of the pine—the one that looks like a little spire—is where I sit and sing. The pepper tree by the arbor we use as a swing, it sways and bends you see with every tiny breeze, and I don't mind telling you that the rubber tree near with those big glossy leaves is just the best place to go when it rains you ever saw. You would rather have the house? Oh, very well, but perhaps you have never tried the tree, and I have.

On the whole things are quite comfortably arranged, seeing that folks planned them, but folks, you have probably noticed, never seem to have as good ideas about gardens as birds. Now birds would get trees that have fruit on in the winter, or all the year around; but in this garden the figs and apricots and cherries and things all come in the summer when we would just as soon travel as not, and in the winter when it is rainy and cold—just the kind of weather to stay at home—we have to go out and hunt for something to eat, not even a leaf left on those trees. Such shocking bad planning! The only trees they do anything with in the winter are the orange trees, and it does amuse us birds so to see them fuss and work over them. You know of course that oranges have great thick ugly skins and don't amount to anything. Why, even chickens know that they aren't fit to eat, and chickens (but I would not want this repeated) are not very smart either.

I notice that there are no purple roses here either, and to an artistic bird like myself that seems a great pity. Purple is a favorite color of mine, except for violets. I would prefer them pink. However, I make it a point never to find fault, and I dare say the people who made this garden did the best they knew how. In any case a very sensible woman lives here now. She never keeps a cat or dog, and I heard her tell the girl to be sure and save all the crumbs and bits of bread and throw them out for the birds. She is probably anxious to have so brave a bird as I am stay in her garden to protect her.

Why one day as I was flying from the lettuce bed—I find a little lettuce very refreshing in the morning—what do you suppose happened? A great big black spider,———

Here I am, up here in the tree above you. My voice may sound a little faint, because you see I am some distance off, and then there doesn't seem to be much of my breath left. I'm afraid I will have to finish that story some other time. You see while I was talking, one of those disgusting cats from the white house on the corner came into the yard, and it brought on a bad spell with my heart. My heart flutters and throbs so that I have to fly to the highest branch of the tallest tree before I can get my breath again. It is very provoking that these spells always happen when I see a cat; otherwise I should pick their eyes out as I have often threatened. We are a very brave family, and frequently make larger birds shudder telling what we intend to do if any of those hateful creatures cross our path, and if I can only get over this heart trouble, I tell you plainly it will go hard with the cats, very hard indeed.

M. CAROLINENSIS.

SWEET PINKS.

When sky first dropped her sweetest dew
  Upon the earth at break of May,
The aromatic fragrance flew
  To every pink, that sunny day;
Till now the humblest plot of soil
  May feed its blessing to us all,
Scenting the air with honeyed oil,
  At purest passion's silent call.

WILLIS EDWIN HURD.

NESTING OF THE SHOVELLER DUCK.

The Shoveller or Spoonbill Duck is a common migrant in Illinois and Indiana. It has been reported as a summer resident and breeder of Lake and Stark counties, Indiana. One nest discovered May 4, 1890, at English Lake, Starke county, was situated amongst a clump of willows bordering a wet meadow, and contained nine fresh eggs. The fact that this bird has been observed in Cook county, Illinois, late in May, would tend to show that the Shoveller has probably nested in the vicinity of Chicago. However, these may have been "cripples" and unable to proceed to their natural nesting grounds further north, though its breeding range in North America extends from Texas to Hudson Bay and Alaska. Streams whose banks are fringed with wild rose bushes and buck brush, or a grassy slope adjoining a small body of water, are the favorite nesting places of the Shoveller.

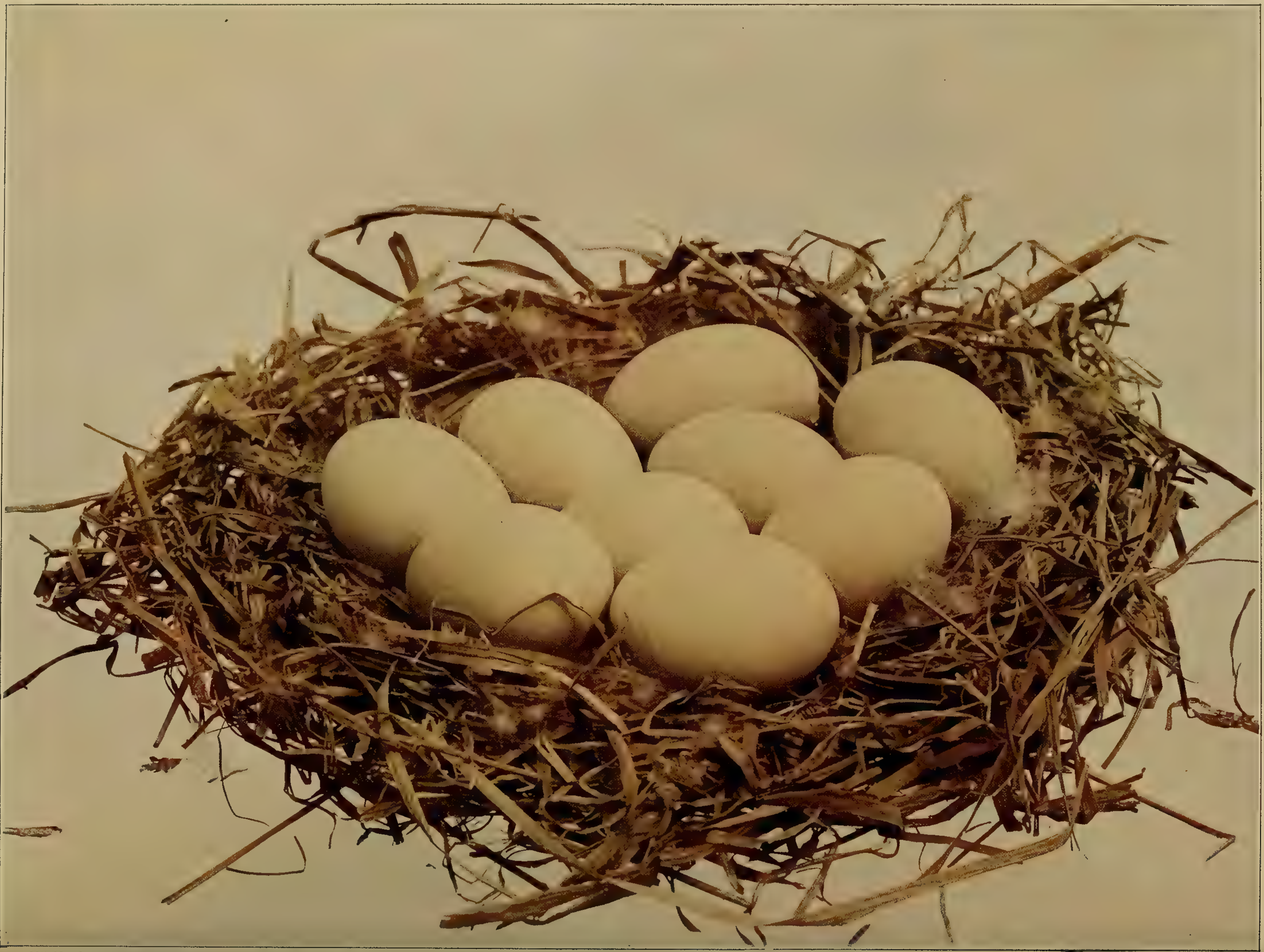
In North Dakota I found this Duck to be very unsuspicious during the nesting season, preferring the small ponds and coulees back from the main lakes, where I often surprised them swimming in company with the bluewing teal. Both the Shoveller and teal are excellent examples of our true pond or river ducks and their greatest delight is to lurk along the borders of some boggy lagoon, where they feed either by "dipping" in the shallow water or by "dabbling" in the soft, slimy mud, for which purpose the bill of the former is especially adapted.

The female is very bold in the defense of her young. I surprised a mother and her ducklings, one afternoon, while I was exploring along the border of a small pond. They were mere balls of down, just out of the shell, and she was probably leading them from the nest to give them their initial "ducking." Before I could get to her she reached the water's edge with her progeny and from the way those little fellows scampered out of sight among the reeds, it was quite evident that they required no lessons in the art of swimming. In the meantime the parent bird was making herself conspicuous, throwing a spray in every direction as she splashed about in the water, keeping up a continual "quacking" until I withdrew from the spot.

Usually a nest is formed by scraping together a small quantity of grass and stems, under which each egg is buried until the full complement, varying from seven to ten in number, is laid. The female then uncovers her eggs and proceeds to incubate, each day adding to the warmth and beauty of her treasures by plucking the dark down from her breast and arranging it about the eggs, still taking the precaution of concealing them before leaving the nest, which she does only to obtain a few morsels from the lake close by where no doubt her mate is anxiously awaiting. Shovellers are very close sitters, and it is not an uncommon occurrence to capture the parent bird on her nest.

In order to obtain a perfect "set" free from "nest stains," I took the nest and eggs here pictured, when nearly fresh, hence the scarcity of down in the nest. This would not have occurred had the bird been permitted to sit a week or two, before being disturbed. However, this would probably have destroyed, to a certain extent, the natural tint in the eggs, which is a peculiar, dull grayish green, elliptical or nearly so in shape, with an average size of two and one-tenth inches in length by one and one-half inches in width.

Gerard Alan Abbott.



FROM COL. OF GERARD A. ABBOTT.

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JADE.

Jade is a term applied in general to a tough, fibrous mineral of a greenish color having the composition of a pyroxene or amphibole. Until recently the mineral was supposed to form a single species, but it is now known that at least two species are grouped under this title. One of these is a form of pyroxene and is known as jadeite, the other is a form of amphibole, and is named nephrite. Further the term is often used to include any tough green stone having a hardness between 6 and 7 and taking a good polish, since such rock or minerals are often carved by people who use true jade. Jadeite is a mineral of definite composition, it being a silicate of soda and alumina. The percentage composition of pure jadeite is—silica 59.4 per cent, alumina 25.2 per cent and soda 15.4 per cent. Its hardness is a little below that of quartz or between 6.5 and 7, but its extreme toughness makes it often seem harder than this. It is a rather heavy mineral, its specific gravity being 3.35. In color it varies from nearly white to nearly emerald green. The white varieties sometimes contain spots of bright green supposed to be due to chromium. The mineral does not crystallize, but is known from its optical properties to be either monoclinic or triclinic. It does not occur transparent, but has a peculiar translucency or subtranslucency not unlike that of horn or fine porcelain. It has a fibrous to granular structure readily seen under the microscope and a splintery fracture. It is very tough. Jadeite fuses readily before the blowpipe to a transparent, blebby glass and colors the flame yellow, thus differing from nephrite which is almost infusible. The term chloromelanite is applied to a dark-green to black jadeite containing considerable iron.

Objects of jadeite carved in prehistoric times are found abundantly in Europe, Asia, America and Africa, but only a few of the original localities whence it was obtained are now known. The most important locality known at the present time is in Upper Burma in the vicinity of Monoung. The jadeite occurs in bowlders embedded in a reddish yellow clay in the valleys of tributaries of the Dschindwin river. The bowlders are mined by digging shallow pits after the fashion of the Burmese miners, as many as a thousand men often being employed in this work. The miners break the bowlders by heating and when pieces of quality suitable for cutting are found they are either laid aside to sell to caravans which come to the mines for this purpose from China or are turned over to native artisans who reduce them to desired shapes by sawing them with a saw made of steel wire strung on a bamboo bow. The jadeite from this locality is commercially distributed all over China, where it is held in high esteem and commands a high price. Bauer states that he saw a piece containing less than three cubic feet which was valued at $50,000. The jadeite of milk-white color is that most highly esteemed, although that with bright green spots is also considered of superior value.

Nephrite is a variety of amphibole much resembling jadeite in color, hardness and texture. It is, however, of somewhat lower specific gravity than jadeite, ranging as it does from 2.96 to 3.1, and it fuses with much greater difficulty. Under the microscope a section shows a finely fibrous character differing from the broad fibers or graniles of jadeite and the optical characters throughout are those of an amphibole rather than of a pyroxene. In composition nephrite is a silicate of calcium and magnesium, having the theoretical percentages, silica 57.7, magnesia 28.9 and lime 13.4. A little alumina, iron and soda are often found combined with the above. Nephrite has the glistening luster and semi-translucency of jadeite and like that mineral breaks with a splintery fracture. It is not attacked by acids. It does not occur in distinct crystals.

The most important locality for nephrite at the present time is Turkestan where it occurs in the Karakash valley in the Kuen Lun mountains, and at other points in the same range.

In these localities it forms layers in gneiss and amphibole schists. The nephrite from these localities is unusually pure and translucent. Some of the mines have been worked for over two thousand years.

Nephrite of excellent quality also occurs in eastern Siberia in the beds of the Onot and Chara Jalga rivers. It occurs here as boulders, one of which is described as being twelve feet in length and three feet in width, and it is also found in place. A canopy thirteen feet in height has been made for the tombs of the present Czar of Russia and his wife of nephrite from this locality.

In New Zealand nephrite occurs in several localities on the west coast of South Island and is used extensively by the Maoris for fashioning into weapons and ornaments.

Boulders of nephrite have also been found in river beds in Alaska. In several river beds of Europe nephrite is found as pebbles and it occurs in place in the region of the Zabten mountains in Silesia, but none of these localities affords an important source of supply.

Jade, including both jadeite and nephrite though still highly prized by the Chinese and other people of Asia, is little used by Europeans at the present time. Among early man, however, in Europe, Asia, America and Africa, the use of jade seems to have been well-nigh universal. Ornaments and utensils of this stone are found among the remains of the lake dwellers of Switzerland, the ancient peoples of France, Mexico, Central America, Greece, Egypt and Asia Minor. The remarkable similarity in the material from which these objects are made, as well as their resemblance in form has led some authorities to conclude that they came from a single region and indicate a migration of people from one locality and a commerce in this stone. If the evidenc to this effect were sufficiently convincing it would make possible many deductions regarding the peopling of the globe of which we have as yet little certain knowledge. Those who oppose the view of the distribution of jade from a single source declare that the stone was found in each different country and was similarly selected at a certain stage in the development of each people. This view seems to be supported by the fact that the so-called jade objects of different peoples are not composed exclusively of the two minerals above mentioned, but include any stone having about their physical characters and color. Still the two minerals jadeite and nephrite largely predominate. The two are equally used by the Chinese of the present day who do not seem to distinguish between them. Their name for jade is Yu, or Yu-shih (Yu-stone). In general it has been found that the peoples nearer the equatorial zone of the earth use more jadeite and those nearer the poles more nephrite, but whether this use is anything more than accidental cannot be said.

The name jade is from the Spanish piedra de hijada, "stone of the loins," and was given by the Spaniard Monardas in 1565 to the jade brought from Mexico and Peru because these stones were reputed to be of value in kidney diseases. This name was given the Latin form lapis nephriticus by Clutius in 1627 and hence comes the word nephrite. Jade is also known as ax-stone because of the amount of it used in making these objects.

The Aztecs applied the name chălchihutl to a greenish stone which they used exclusively and prized highly. This in some instances proves to be jade and in others turquois. It is probable that much of the so-called emerald of ancient writers and historians, both of Europe and America, is jade.

Oliver Cummings Farrington.

PRECIOUS CORAL.

Of the great number of forms and species of coral known a single one furnishes nearly all that is used in jewelry. This species is known by the scientific name of Corallium rubrum, and belongs to the family Gorgonidae of the group Alcyonaria. It is a branching coral, shrub-like in its appearance, and grows to a height of a foot or more, with stems an inch in diameter. If the living coral be examined it will be found to consist of an outer fleshy or gelatinous portion enclosing an inner, hard, calcareous skeleton. The outer portion is made up of numbers of polyps as the little coral animals are called, joined together. The projecting polyps look in life like little warts over the surface. Each has eight tentacles. The internal skeleton differs from that of the majority of corals in being red in color. When the coral animals die this internal skeleton is left and by polishing it, the coral of jewelry is obtained. This kind of coral grows almost exclusively in the Mediterranean Sea. The localities where it is most abundant are the coasts of Algiers and Tunis, the western coasts of Sardinia and Corsica, portions of the coast of Sicily, the western coast of Italy and a few localities on the southern coasts of France and Spain. The coral forms banks at depths of from ninety to one hundred feet, growing up from the bottom. That of the greater depths has not as rich color as that nearer the surface and does not grow to so large a size. The work of dredging the coral is performed by fleets of small vessels manned by crews of from six to twelve persons. Work is carried on only in the summer months because of the stormy weather at other seasons. The vessels are obliged to put out about six miles to sea in order to reach the best fishing grounds and the work is of a laborious and dangerous sort. The dredging is performed by means of an appliance consisting of two heavy oaken sticks bound together in the shape of a cross, from the ends of which hang ropes upon which are fastened nets with meshes of different sizes. On being sunk to the botton by means of a heavy stone, the nets of the dredge entangle the branches of coral and upon drawing to the surface the latter can be picked off. The price obtained for the raw coral is from four to seven dollars per pound, each vessel securing from three hundred to four hundred pounds in a season.

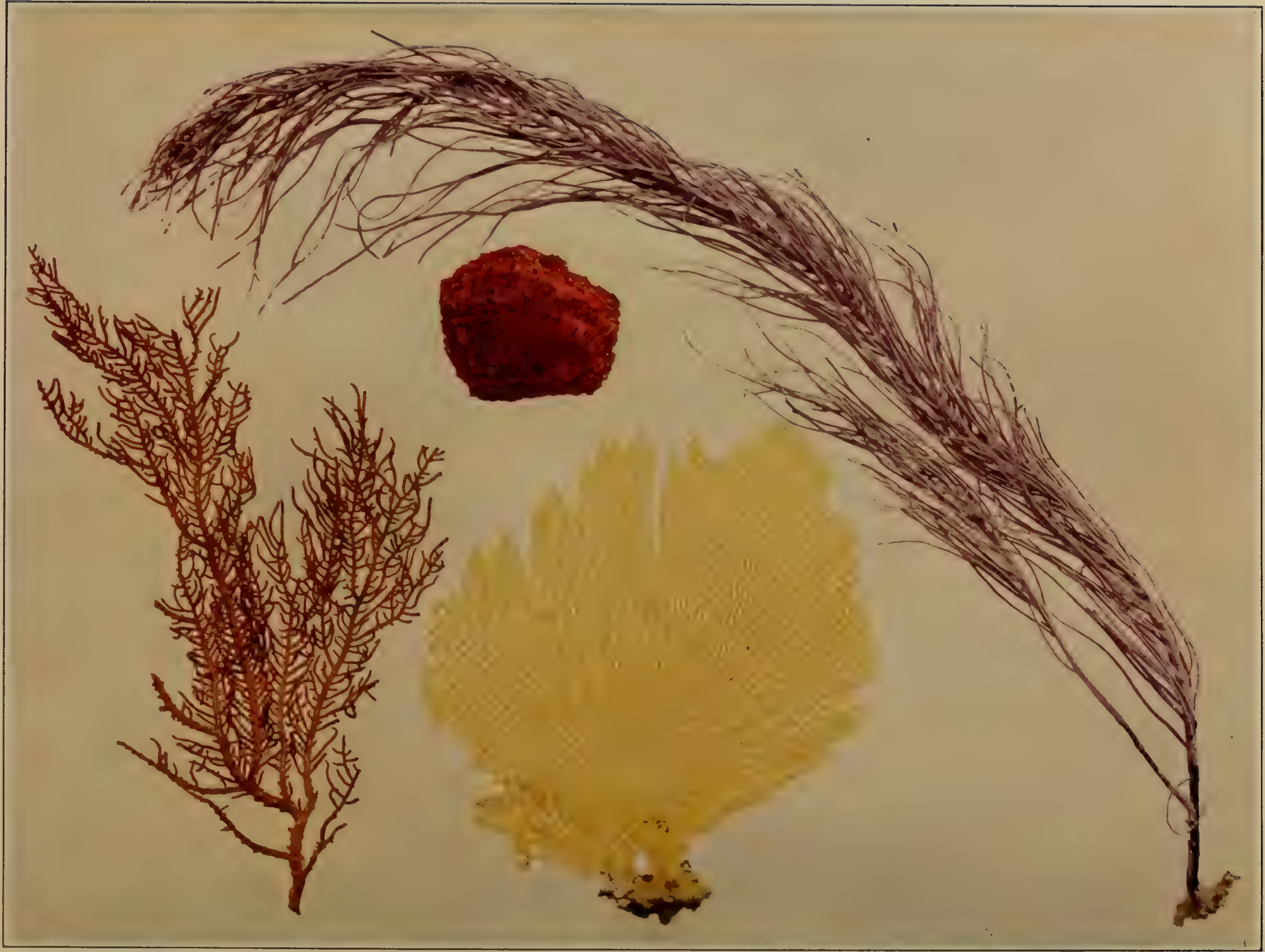
The industry is almost exclusively in the hands of Italians, although originally carried on by the French. The latter are said to be striving by means of subsidies and in other ways, to regain control of the industry, especially on the Algerian coasts. The production from this region alone amounts to 22,000 pounds yearly. The cutting and working of the coral is carried on chiefly in factories in the cities of Genoa, Leghorn and Marseilles. The value of the crude coral varies considerably according to its quality. If the coral polyps have died before a branch is brought to the surface, the coral turns black and its value is thus considerably decreased. On the shores of Sicily a large proportion of dead coral is brought up and the proportion is continually increasing. The cause is believed to be the quantities of volcanic ash thrown from the neighboring volcanoes which makes the water too muddy for the polyps. Some of the coral found is considerably worm eaten and this sort is highly valued in some parts of India, although regarded worthless in Europe. The particular shade of coral most highly valued by Europeans varies from time to time. At one time the bright red was preferred, then a pale pink or rose color came into fashion and now the red seems to be most in favor again. The color, whatever it is, should be uniform to make a piece of coral of the best quality. The forms into which coral is cut include beads, buttons, ear-ring drops, cameos and carvings of various sorts. Polished pieces of branches an inch or two in length are often worn in bunches either as brooches or in the form of bracelets and necklaces. These were supposed in former times to act as a charm to ward off bad luck and evil spirits. Coral is especially prized by dark-skinned people such as the Italians, Moors, Persians and Hindoos, because its color harmonizes well with their complexion. The Chinese also use immense quantities of it, although the effect in color as contrasted with that of the wearer, is less favorable to them. Precious coral seems to have been known and prized in earlier times by the Greeks and Romans. The Greeks called it gorgeia and believed that it originated from the blood which dripped from the head of Medusa and which becoming hard was planted by sea-nymphs in the sea. In the Middle Ages precious coral was used in medicine as an astringent and was given to newly born infants. To this day the Brahmins and Fakirs of the East place it upon their dead to prevent evil spirits taking possession of the corpse. Coral is imitated in celluloid, also by a mixture of marble dust cemented with glue and stained with vermilion. Beads of bone and of gypsum are also stained so as to imitate coral. These imitations can be distinguished by chemical and physical characters, true coral having a specific gravity of 2.6-2.7, and a hardness of nearly 4. It also effervesces with weak acid, which would not be the case with any but one of the above imitations.

Oliver Cummings Farrington.

BLESSED RAIN.

Dear heart, dost thou complain
When the kind God sends rain?
  Think of the thirsting crops
  That drink the beady drops—
Think of the flowers, unfolding all their sweets—
The city's burning streets,
  The famished flocks upon the mountain tops—
The windless casements, where the sick in vain
Cry for the cool, sweet rain!
Think—and thank God
For every drop that quivers on a clod!

Frank L. Stanton, in "Up from Georgia."



FROM COL. CHI. ACAD. SCIENCES.

CORALS.

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CORALS.

SEA-FANS AND SEA-WHIPS.

The animals commonly known as Corals, sea anemones and polyps, have been very appropriately called zoöphytes or flower animals from their close external resemblance to flowers and also from their variety of brilliant coloration. Many species, as the sea fans, sea plumes and sea whips, grow in a manner so like the shrubs and trees that until a comparatively recent date, they deceived even the men of science. The older naturalists classified many of them as plants and it was not until the middle of the eighteenth century that their true character became definitely known.

These animals form a part of the subkingdom Coelenterata and in classification are placed between the sponges (Porifera) and the planarian worms. The name Coelenterata is well chosen. It signifies a hidden digestive tract and refers to the fact that the stomach is concealed in the lower part of the body, directly in the center of the animal.

The general plan of all Coral animals is essentially as follows: The body is rounded, cylindrical and sac-like and is divided internally by partitions called mesenteries, which are usually six or eight in number. In the center of the body, and suspended by the partitions, is placed the stomach which is connected with the body cavity by little openings. The mouth is placed in the center of the upper surface and is surrounded by a circle of tentacles. The most notable character of these animals is the presence of stinging organs known as lasso-cells which have the power of throwing out little barbed bodies or nettling cells which serve as a means of defense and also as a means of procuring food.

The animals comprising this branch of Zoology differ widely in external form. They range from the minute hydroids which encrust stones at low water to the beautiful stone building Corals, the brilliant sea anemones and the curious jelly-fishes. Some are stationary for life, while others swim about from place to place. Some live on the surface of the ocean, while others live at the bottom of the sea in very deep water. With the exception of a few small hydroids, all are marine and the majority of these live near the shore of continents and islands. Typically they are tropical animals, although a number, particularly the jelly fishes, live in northern seas and some of the Gorgonias live in the arctic seas at a considerable depth. These animals are directly of little use to man, but indirectly they have done more for him than almost any other animal. The stony Corals have built up islands, added to the growth of continents, and their fossilized remains are now used for building purposes under the names of marble and limestone. They have been engaged in this work for millions of year and we find their remains in the oldest geological rocks. In many places, as at Cincinnati, Chicago and parts of Ohio and Indiana, extensive ancient reefs have been found which show that this class of animals flourished in large numbers in the old Silurian sea.

The subkingdom Coelenterata is divided into four classes; the Hydrozoa, which includes such animals as the freshwater hydra and the little incrusting hydroids of the seashore; the Scyphozoa, or the jelly-fishes; the Anthozoa, including the stony corals, the sea anemones, sea fans and sea plumes, and the Ctenophora, or comb-bearers, which are small, rounded, jelly-like animals of peculiar form.

The class Anthozoa is divided into two subclasses of which the first, the Alcyonaria, will be considered in this article. In this group each animal or polyp has eight pinnate tentacles and the same number of mesenteries or partitions. All are marine and the great majority form colonies which assume arborescent or tree-like forms. The growth of these masses is very interesting, but difficult to understand from the dried specimens usually seen in our museums. When alive each branch or coral stock is composed of soft, fleshy tissue, called the coenenchyma, throughout which there ramifies hundreds of little irregular canals which serve to connect the polyps with each other. Scattered over the surface of this fleshy foundation are many little cylindrical Coral animals (polyps), the distal end of which is surmounted by eight pinnate tentacles which surround the oval mouth. The outer skin, called sarcosome, forms a calyx or cup into which each polyp may be withdrawn and completely concealed when disturbed. The coenenchyma, as well as the polyp itself, is more or less supported by numerous calcareous spicules, which may be scattered throughout the mass or may form a regular skeletal support, as in the hard part of the precious Coral and the fan-like structure of the sea fans. In one family there is a horny secretion which covers the polyp. The alcyonarian polyps increase in size by a system of budding from the sides or top of the Coral stock. The fleshy stock or foundation pushes forward its ramifying canals, which carry nutritive material, and at the base of an old polyp or on disk-like expansions new polyps begin to grow or bud out, much as do the buds of a flower. By constant budding in this manner a large Coral stock may be built up. These animals have no special outlet for the waste products of digestion. These are thrown out of the mouth when all nutritive matter has been extracted.

The lowest forms belong to the order Alcyonacea which includes many corals supported by a fleshy coral stock. In many cases these animals encrust foreign objects. The most familiar member of this order is the organ coral (Tubipora musica). This coral is common throughout the Indian and Pacific Oceans, and the coral stock often attains an immense size. Each coral polyp forms a red tube and each series of polyps is separated from the series below by a horizontal partition, so that in a large specimen of this coral stock there seems to be a number of tiers of tubes, each tier being separated from the one above and below by a flat partition or floor. It is this peculiar form which has given it the name of organ coral. Each little polyp is able to retract into its tube and thus secure protection from its enemies.

In the order Pennatulacea or sea-pens and sea-feathers, the coral polyps form upon a stock called the rachis. This bears a stalk which is embedded in the mud or sand. The colonies are more or less locomotive and are able to move from place to place. One of the most striking forms of this order is the Renilla, the rachis of which is spread out in the form of a leaf or a kidney. A long pedicel or stem extends from the lower surface and anchors the colony to some foreign object by means of a peculiar polyp-like organ called a siphonozoid, or siphon-animal. The upper surface of the rachis is covered with many little coral polyps which are attached to the rachis by a rather long stem. The tentacles are wide and covered with little feather-like expansions on the edges. The rachis is of a rich purple color, the polyps being of a much lighter shade. According to Agassiz these animals are remarkably phosphorescent, emitting "a golden green light of a most wonderful softness." They are found in the Gulf of Mexico and in the Atlantic and Pacific Oceans. Many of the sea-pens form a long, feather-like rachis, not a few of which live in very deep water.

Another order is the Gorgoniacea which includes the large and showy sea-fans and sea-plumes. They are all attached to some solid base and the axis or coral stock is more or less firm and is covered by a fleshy coenechyma. The coral polyps project from this fleshy covering and when their tentacles are expanded they resemble many little stars. The best known members of this order are found in the family Gorgoniidæ. The common Gorgonia flabellum or sea-fan is a most beautiful object, the vertical and lateral extensions of the coral stock forming an exquisite lattice work. In the sea-plume, Gorgonia acerosa, the coral stock does not form a lattice work, but a few long and straight branches support a countless number of small fronds which extend from each of the main stems at regular intervals. To fully appreciate and understand these animal colonies one must imagine this fan or plume to be covered with polyps, each with its little expanded tentacles. Add to this the colors, yellow, white, brown, red, crimson, purple, orange or black and the picture of these exquisite creatures is complete. A species from California, the Eugorgia aurantiaca, is bright orange red in color and its branches are rather stiff. In the family Plexauridæ the branches are very thick and heavy, resembling in some respects a sponge, and the polyps are placed very close together. The genus Eunicea is the most common and best known member of this family. The most valuable Alcyonoid coral is the red or precious coral (Corallium rubrum). It is the only member of this subclass which has a coral stock or axis hard enough to polish. This property has led it to be much used for jewelry and for a number of years it has been collected for this purpose. The polished article is quite unlike the coral as it is taken from the water. Instead of being smooth and polished it is roughened by many little ribs running longitudinally, giving the coral a fluted aspect. The family Antipathidæ, although not classed as Alcyonaria by many zoologists, contains some interesting forms. The coral stocks are called sea-whips and are very long, flexible and of a black color. The overseers of the Spanish plantations formerly used these sea-whips to punish their slaves, and when twisted or braided together and knotted they must have been veritable instruments of torture.

Frank Collins Baker.

THE LILAC BUSH.

Though stripped and lashed by the unmannered gale
Beneath the portent of an hostile sky,
How many times, from sheltered window nook
My lilac bush, I've watched your strength defy

The onslaughts of wild Winter's fierce allies,
Rising at once from every buffeting,
To spread your slender arms in wide disdain,
Of this dark season ere the robins sing!

Firm is your roothold in the frozen ground—
Then be dead leaf and empty nest forgot!
In your long dream the sky is changless blue,
The menace of the storm concerns you not.

I envy you! O that my listless soul
Would store its Summer largess thus, until
Strengthened in calm, life's bleaker intervals,
Were weathered by unconquerable will!

Lulu Whedon Mitchell.

THE MUSKALLUNGE AND ITS RELATIVES.

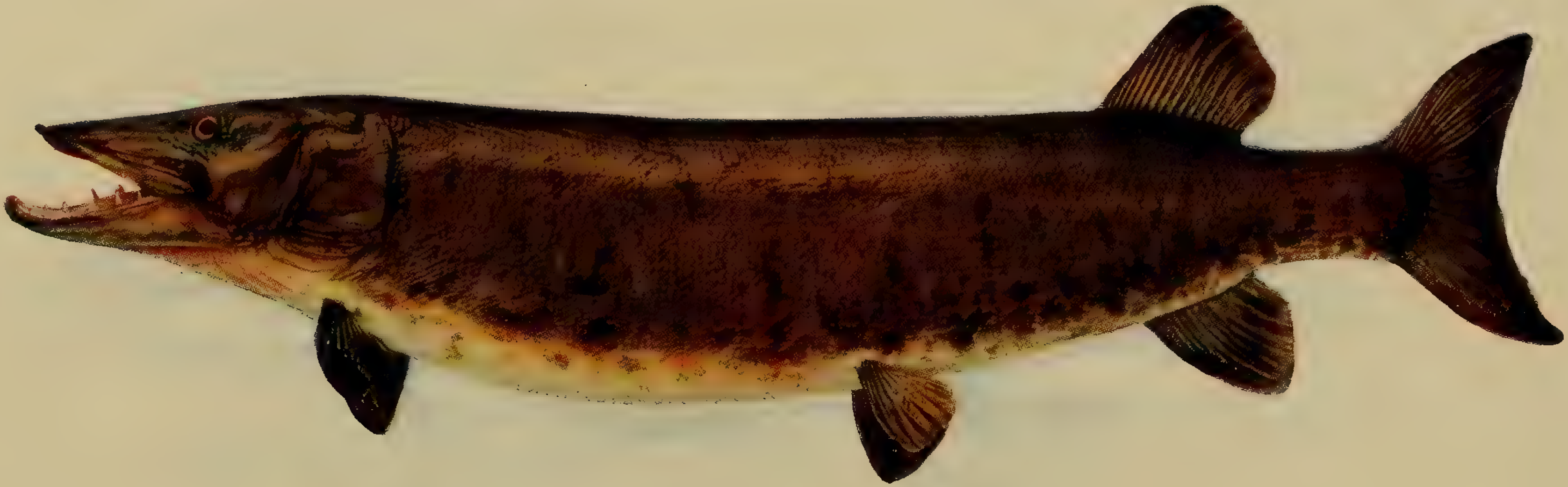
> The goodly, well-grown trout I with my angle strike,
> And with my bearded wire I take the ravenous pike.
> DRAYTON, "The Muse's Elysium." Nymphal 4.

The Muskallunge, pike and pickerel are related fishes, having similar habits and belonging to the same genus. It is the only genus of the pike family which is considered the most ancient family of the fresh-water fishes. There are but six species, all of which, except the common pike, which is cosmopolitan, are confined to the waters of the American continent. These fishes are all noted for their greediness and remarkable voracity. They have been described as "mere machines for the assimilation of other organisms." They are graceful in every motion and keenly alert as they lie in wait or move slowly in search for food. Thoreau speaks of the pickerel as "a solemn, stately, ruminant fish, lurking under the shadow of a lily pad at noon, with still, circumspect, voracious eye, motionless as a jewel set in water, or moving slowly to take up its position; dashing from time to time at such unlucky fish or frog or insect as comes within its range and swallowing it at a gulp. Sometimes a striped snake, bound for greener meadows across the stream, ends its undulatory progress in the same receptacle." The greed of the Muskallunge is well stated by Dr. Jordan, who says, "Eighty pounds of Muskallunge represents several tons of minnows, whitefish and the like."

With the possible exception of the Muskallunge, the members of the pike family are not held in high estimation by the anglers of America. Dr. G. Brown Goode attributes this dislike for the pike and pickerel to the fact that many of the American anglers "unite in themselves the taste of the angler and the fish culturist." It is indeed true that in any body of water where these species are found, no other kinds can hold their own. The fish culturist desires their extermination and in this he is assisted by the fish themselves. They are cannibals and, as Dr. Goode adds, "only a very limited number of these fish can live in the same pond, for they devour each other, and at the end only a few patriarchs, imposing in strength, size and voracity remain."

The Muskallunge of our illustration is the species that frequents the lakes and rivers of Wisconsin and Minnesota. Of this species General Israel Gerrard says: "This is the fish that has just claims to the name The Great Northern Pike, as there is abundant and unquestionable testimony of its enormous size, ranging from forty, seventy-five, eighty and one hundred and ten pounds in weight. The habitat of this fish is the waters of the Mississippi system and it has been well known, under various local names, since the earliest settlement of the West. It is now found in the greatest abundance and of the largest size in the clear cool lakes of the Wisconsin and Minnesota pineries, at the head of the tributaries of the Mississippi." It is a "dauntless marauder," a good fighter and because of its immense size requires the most skillful angling for its capture.

There are three forms of the Muskallunge. The typical form known as the Great Pike is confined to the Great Lakes and their tributaries. A variety called the Chautauqua is found chiefly in the Chautauqua lake, and is highly prized as a game fish. The third form is that of our illustration. The name of these fishes is from the Indian name "Nosconongе," and is variously spelled.



MUSKALLUNGE.
(Lucius masquinongy immaculatus).

FISH SERVE FOR LAMPS.

In Alaska there is little need for light during the summer season for then nature's grand luminary is sleepless.

But during the long, dark winter, when the natives require an almost constant light, they have the most inexpensive and ingenious substitute ever ready at hand.

The water supplies them abundantly, with the Ulikon, or, in native parlance, the candle fish.

These, in size, resemble our smelts; but they are so full of oil that when they are dried they melt almost entirely away.

The Indians dry them and store them away to be used both as food and light.

When they are to serve the purpose of a lamp, a piece of rush pith or the inner bark of the cypress tree is drawn through them as a wick, a long needle of hard wood, being used for the purpose. A match is then applied at one end, and the fish burns clearly and brightly, until consumed. The illumination given by one candle fish being equal to that of three or four tallow candles. These fish run in great schools, at certain seasons of the year. They come in from the sea, and invade the rivers and lakes about the shore. The Natives rake them in with monster combs.

The quality of oil they contain prevents their being preserved in alcohol, as was discovered when some specimens were being prepared for the Smithsonian Institute, at Washington.

The Alaskans often boil them, and allow the oil thus obtained to harden into a butter, not unlike our dairy article. They, however, eat their butter only after it has become quite rancid.

LOUISE JAMISON.

FISH SCALE IN A NEW ROLE.

There are several shops in the downtown district of New York City where is carried on a novel sort of industry.

This is the manufacture of artificial flowers from fish scales. At a first glance these odd imitations of the vegetable kingdom present a rather fantastic appearance, for, while in shape and color they follow the conventional type, they possess a firmness of line, a transparency of tissue, and a play of color, which renders them unique of their kind.

"Not many people know about them," the deft young worker in one of the shops informed me, "you see they are quite new, so far as New York is concerned," she added. "We have learned to make them in the last year."

The industry, itself, is a very old one, however. The Indians of Venezuela and Northern Brazil have practiced it from time memmorial and as they had the marvelously colored fish of the tropical seas to draw upon, they were especially favored in the matter of material. They, in time, taught it to the Spaniards of the West Indies.

During our Spanish war the trick of manufacture was introduced into Florida, and in time it reached New York, where these oddly beautiful flowers promise to become very popular.

Apparently, they are not difficult to make, the worker's table and tools resemble, upon a casual inspection, those used by a jeweller. The scales are always flat when they come into the hands of the operator, but by means of small compression they are concaved or curled in order to simulate petals, sepals, and many forms of leaves.

Afterwards they are easily fastened together, or to wires, with strong fish glue.

LOUISE JAMISON.

A CALIFORNIA MIDWINTER VIEW.

From the tower of the Hotel del Coronado, Coronado, California, an unrivaled bird's-eye-view can be had of Coronado, San Diego, bay and ocean.

Up, up we clamber, and finally reach the top, turn about and look below. "How beautiful!" is the exclamation of every one. Out we look on one side, as far as the eye will let us, over a wide stretch of green, blue sea, tumbling and dashing; flecked with foamy, white crests, and sparkling in the sunlight, reaching all the way from Point Loma, to the mountains in old Mexico, and forming a panorama of evershifting beauty.

At sea, miles away the Coronado Islands stand out like blue sentinels guarding the entrance to the bay. Sometimes they form a beautiful mirage.

The day is charming; the air warm and balmy, while the sun shines brightly, radiantly from overhead, lightening up the wide, waste of waters, all around, until they glisten like flashing brilliants. Coronado is under our feet and seems to be in the center of the sea. Within the circle of its vivid green can be defined the long avenues of palm, and pepper trees which, retaining their greenness the entire year, reach down to where they meet the azure brightness of the sea.

Beyond Coronado to the north the eye is able to take in another expanse of blue water; the ever-changing, yet motionless, marine picture of the wide sunny bay.

The Bay of San Diego, calm and deep, lies before us, a vast sheet of quiet water with cool, silvery, blue tints, surrounded by fair green shores. Many are startled into exclamations of delight with their first view of the bay. Dotted with sail and row boats flitting about swiftly in every direction upon its placid breast, and overhung with soft gray clouds of smoke from the Coronado Ferry, it makes a study of color such as is rarely seen.

Casting our eyes across the bay we catch a glimpse of the peerless city of San Diego rising abruptly from the water and crowning the hillsides, white and dazzling like a city of marble against a green background.

Later on as the day wanes, a gorgeous sunset unfolds its splendor in the western sky. The sunsets as seen from Coronado Beach are incomparably beautiful.

"From amber and gold so bright
To azure and gray so grave."

With the approach of evening, the wind which has been tumbling white, frothing billows shoreward all day dies away. Low down in the horizon hangs the great round golden sun, coloring vividly the sky with its floating clouds; tinting them orange and gold, and edging the waves below a soft rose color.

On our right is Point Loma, rugged and gray, standing as if at anchor where the white, salt waves beat round its base. Its summit is crowned by a light house which is said to be the highest in the world.

The picture is bounded by dainty glimpses of golden landscape, hills and sea which mingle in beauty and softness with the blue mountains that loom up in misty splendor, and open away in the distance outlined against the light of the sky. The whole effect is one of exquisite charm. San Diego presents a grand appearance in the soft light of the dying day. The roofs and spires are brilliantly aglow with the lingering rays of the setting sun which kisses the glass of the windows, framing them in pure gold.

Suddenly a steamer rounds the promontory, leaving a long line of smoke hanging in the air stretching away for miles. Even it is softened by the dying sun which flashes rosy gold on the cabin windows, tall masts and snowy sails.

A flock of sea gulls floating gracefully up and down on the waves rise heavily out of the water, their white wings flashing in the sunshine, sail lazily overhead and pause an instant as if interested in the sport of a merry party of bathers which dot the water below with the gay colors of their costumes; then uttering a low wailing cry, they fly far away until they appear but tiny specks in the distance.

The scene is changing every minute. The sun wavers; sends one last, hot, burning glance, and just as it sinks slowly into the bosom of the water, the United States Flag, which all day has been waving in the breeze, is lowered from the staff of the San Diego Barracks; a sharp report from a cannon rings on the air and is borne to our ears across the bay, announcing that another perfect Southern California day is about ended. The shadows deepen on the hill and mountain; night closes down over the land locked harbor. In a vast circle around, lights begin to twinkle and, reflected in tthe water glitter brightly. Red and green lights appear on the steamers and vessels lying at anchor in the bay. To the north, a bright glare in the sky from the electric light masts tell where San Diego lies; to the west, the light house on Point Loma's solitary ridge sends its watchful red beams over the sea; to the east, the moon peeps over the top of old San Miguel. Innumerable stars are beaming gaily in the sky, and the wondrous beauty of the red sunset is changed to the majesty of a starlight night.

CLARA HILL.

MISS HAREBELL.

Dancing in the breezes,
  Springing by the wood;
Ev'ry eye she pleases,
  As each lassie should.
Now her bells in blessing
  Swing where fairies meet,
Now bright ferns caressing,
  Nodding at her feet!

How her smile is cheering
  Toilers on the road;
The old and dull of hearing
  Bearing heavy load.
With sweet grace and beauty,
  And in charming mood,
Doing humble duty
  Like you and I, when good.

Linger, blue-eyed darling!
  Bless with gentle power;
Happy as the starling
  In some lady's bower!
Still thy incense flinging
  Fairy forms to greet,
While the birds are singing
  And mosses kiss thy feet;

—GEORGE BANCROFT GRIFFITH.

WINTER HARMONIES.

Nothing in Nature languishes or dies. Perennial energy radiates through all things, and an inexhaustible potentiality lies stored in every clod. We think of winter as a season of arrested energies, a benumbed and ice-clamped, bare and wind-swept time. And yet there is no time of more intense vitality, suppressed it may be, but intense for all that.

We go into the woods as into a shelter, roofed and carpeted from cold. A snug security abides here, and we find a careful housing and husbanding of life which reassures and warms the heart. Here is no death-like trance, no trance-like apathy, but the breathing warmth and stillness of a normal sleep. How soundly they are sleeping, all those thousand little creatures lying close for warmth with their voluminous wide covers all so carefully spread over, with thick earthy blanketings of leaves and velvet mosses!

The very colors, too, are warm and comforting, colors that wear well upon the eye, and grow unobtrusively into the consciousness, with a sweet, homely suggestion of good service; colors that take on a strong dramatic feeling in the bleak gloaming or the yellow dawn, or in the low, slant light of a waning wintry afternoon, thrilling in upon us their subdued, mysterious harmonies.

Warm, dappled browns and grays with here and there a roll of velvet green, a glow of deep, dull red or an unexpected fleck of scarlet are the colors of the woods, while in the open fields, the grays and browns prevail more uniformly. But what gives variety and tone to these scant hues, is the wonderful power of reflection that everything possesses, from the fields at our feet, to the distant branches streaming smoke-like on the far horizon. Scarcely a day passes but there comes some rare and glorified moment when everything takes on a different coloring or shade of coloring, from the clear, crisp shadow of blue distance on the hills, to the red-gold glinting of the broom-sage, from the dull, deep amethystine under-glow of boughs against the sunset sky, to the rosy-purple gleams the flush the stolid clods like inspiration.

Then everything seems irradiated with a kind of glorified and happy patience. We see down into the "heart of things" and it is all aglow with its low-burning inner fires. But at all times, there is a safeness, a security about everything, that inspires us with a continual steady hopefulness and good cheer. Not one of Nature's children has she forgotten, not one has she taken unawares, not one but is bewrapped and overcoated snugly from the cold. Then let the wind blow ever so bleakly over the gusty fields, for every dried and ice-hung grass-blade wagging in the gust puts on a lusty air of bravado which shames our hardiest stoicism. Or let the snow fall ever so deeply, driving and sifting into nooks and hollows, for at the first thaw, out there peeps from its receding skirts some little child-like greenery to cheer us. Or let the gray boughs be ever so bare or even a ragged last year's leaf to wrap around them; we know that they are safely sheathed, and smile serenely to ourselves at thought of our next spring-time folded in a bud.

ETHEL ALLEN MURPHY.

LOANED BY LOUIS G. KUNZE, CHICAGO

STRAWBERRIES

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STRAWBERRY.

(*Fragaria vesca* L.)

> The strawberry grows underneath the nettle
>
> —*Shakespeare: Henry V, i:* 60.

The Strawberries are small, herbaceous plants belonging to the Rose family (Rosaceæ). They are perennial, propagating by means of runners. Leaves are basal, long-petioled, three-foliate, margin serrate. Flowers white, and having the general characteristics of the apple blossom and the wild rose, that is five sepals and five petals with numerous stamens and pistils.

The word Strawberry is both perplexing and scientifically incorrect. In the first place, the edible part is not a "berry," as the name would lead one to suppose. It is simply the much enlarged fleshy torus, or receptacle to which the numerous very small rather hard fruits (seeds) are attached. It is botanically a "false fruit" and not a berry at all. The green five-parted star shaped leafy structure found attached to the base of the so-called berry is the permanent calyx, which is removed before the fruit (false fruit) is eaten. The etymology of "straw" has been variously given. According to some authorities the word was originally "strayberry," referring to the spreading habit of the plant, by virtue of its long rapidly growing stems, known as runners. Others state that the word refers to the stems, which are straw-like in form and size. Still others refer the word to the long established habit of covering the Strawberry patch with straw to keep the soil moist, and to keep the berries clean, as well as to hasten their ripening in the sun.

There are about fifteen species of Strawberries which are natives of the north temperate zone and the Andes regions of South America. About six or seven species are natives of the United States, where they grow wild in prairie lands, as well as in the wooded areas. The best known and most widely distributed species is Fragaria virginiana Duch., commonly known as meadow Strawberry, wild Strawberry, and Virginia, or scarlet, Strawberry. Of this there are perhaps several wild varieties and numerous culture varieties. Fragaria americana is the wood Strawberry of the United States, and is closely similar to the European wood Strawberry (Fragaria vesca).

The numerous culture varieties are derived from a comparatively few of the fifteen wild stock species. The desirable qualities are sweetness (not too much acid), delicacy of flavor, good size, small seeds or pits and pulpiness. Some species are inedible, as Fragaria chilensis, found on the west coast of the United States, with large fruits; and Fragaria indica of India, which is frequently cultivated as an ornamental plant.

Strawberries, for successful cultivation, require rich soil in a protected place. The soil should be well tilled. Plants may be set (in rows several feet apart) either in the spring or fall. They do not yield a full crop until the second summer after transplanting. There are many ways of cultivating and training the transplanted plants, all of which have their special features, and which have an influence upon the ripening and the quality of the fruit. The co-called hill row system requires much care; the matted row system less care and larger yield per acre. Weeds must be kept down. Growers must keep in mind the fact that certain plants produce essentially pistillate flowers and other essentially staminate flower. Staminate plants are not productive, but are essential in pollination. The yield of berries varies greatly with soil, climate, cultivation and variety. Under favorable conditions the yield may be over 200 bushels per acre. The larvae of the June-bug, which feed upon the roots, and two borers are the principal enemies of the Strawberry plant.

The earliest Strawberries came from Florida and the latest from New York and some New England states. Small quantities are grown in greenhouses, but these are expensive, besides being quite deficient in flavor. The berries decay quite readily, hence picking, packing and shipping must be done carefully and as rapidly as possible.

Formerly fresh Strawberries were recommended in calcareous troubles of kidney and bladder. Also in the treatment of gouty affections. Root infusion has also been found useful, likewise Strawberry tea made from the dried leaves. The fruit, so-called in the fresh state, is highly relished by nearly everyone. After being cleaned they are eaten without any addition, but preferably with sugar and cream. They are made into Strawberry shortcake and put up in form of a preserve. They are also used as a flavoring agent in ice cream and cold drinks.

Strawberries do not agree with some people, causing disorders of digestion. Millspaugh reports a case in which a hearty meal of Strawberries caused symptoms not unlike those of scarlatina. It seems that the ancients did not cultivate this plant. It was not cultivated in Europe until about the fourteenth century.

ALBERT SCHNEIDER.

DAWN.

With a ring of silver,
  And a ring of gold,
And a red, red rose
  Which illumines her face,
The sun, like a lover
  Who glows and is bold,
Wooes the lovely earth
  To his strong embrace.

EVE.

In millions of pieces
  The beautiful rings
And the scattered petals
  Of the rose so red,
The sun, like a lover
  Who is weary, flings
On the lonely earth
  When the day is dead.

HELEN HUNT JACKSON.

Vol. XIII. MARCH, 1903. No. 3.

The beautiful is as useful as the useful.—*Victor Hugo.*

BIRDS AND NATURE

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EDITED BY WILLIAM KERR HIGLEY.

ILLUSTRATED BY COLOR PHOTOGRAPHY.

$1.50 a Year. 15 Cts. a Copy.
A. W. MUMFORD, Publisher
203 Michigan Ave., Chicago, Ill.

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MONTHLY, EXCEPT JULY AND AUGUST.

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BIRDS AND NATURE.

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VOL. XIII. MARCH, 1903. No. 3

MARCH.

My steps have passed beside the lanes,
I melt the lingering snow,
And fresh with breath of later rains
My blustering winds do blow.

I bring the promise of the grass,
And from the broken sky,
Where shredded cloud-flakes float and pass,
Comes down the kildee's cry.

The forest feels the quickening sap
And slow with languor thrills;
While, towzled from their Winter nap,
Uprise the giant hills.

On northern slopes still lie the drifts
By dull December sown;
But eastward the horizon lifts
In blue perspective shown.

In noisy crowds the blackbirds dip,
Then wheel in black array,
And close in airy fellowship
The wandering swallows stray.

By divers paths I take my ease
And faint, 'mid coverts cool,
I trace the profile of the trees
On many a woodland pool.

Nor any eye shall see my face,
Though swift my pulses beat;
And none may hear, in hollow space,
The echoes of my feet.

Nor any power shall bid me stay
As fast I follow on;
Like night, that slips into the day,
My thin gray ghost is gone.

You see me in the violet's hue,
The yellow-hammer's wing;
I keep my tryst in fire and dew,
The Spirit of the Spring.

ERNEST M'GAFFEY, in The Chicago American.

THE ENGLISH ROBIN REDBREAST.

(*Erithacus rubecula.*)

Art thou the bird whom man loves best,
The pious bird with the scarlet breast,
  Our little English Robin;
The bird that comes about our doors
  When autumn winds are sobbing?
Art thou the Peter of Norway boors?
  Their Thomas in Finland,
  And Russia far inland?
The bird who by some name or other
All men who know thee call thee brother.
—WORDSWORTH.

The familiar and attractive habits of the Redbreast have for centuries made it a favorite among all classes of people living in the British Islands. Indeed, so deep is the love for this bird that its name has almost assumed a sacred character. It is the Robin Redbreast of childhood tales and has been the inspiration of many writers of prose as well as of poetry. That which has been written regarding this bird would fill volumes. Probably in no part of its range, which covers the whole of Europe, the northern portion of Africa, and eastern Asia, is the Redbreast more revered than in England. There it is the

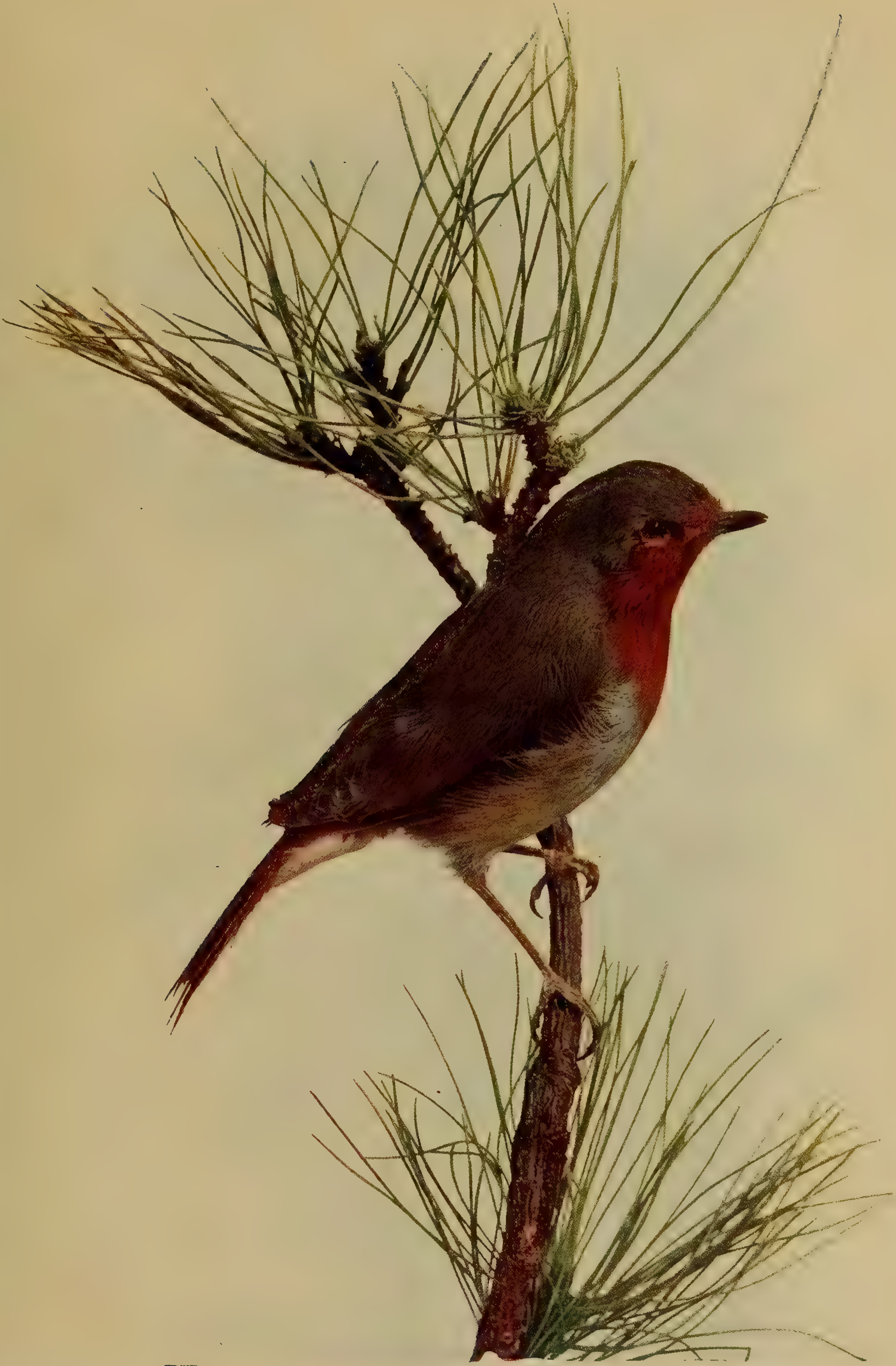
"Robinet with ruddy breast,
Best known of all and loved the best."

"Its sprightly air, full dark eye, inquiring and sagacious demeanor, added to the trust in man it often exhibits," and its intelligence, has caused the people of nearly every country that it frequents to give to the Redbreast some name indicative of endearment.

Many birds that are migratory are social and not only fly and feed in flocks, especially during their migations, but also associate with other birds of similar tastes and habits. This is not the nature of the Redbreast. It not only remains at a distance from other small birds, but also shuns the societv of its fellows. No matter how numerous the individuals may be, who are seeking food in some hedge, each is for itself and the truthfulness of the old saying, "One bush does not harbor two Redbreasts," is apparent. So familiar, however, is the Redbreast with man that it has been called the "household bird with the red stomacher." Though the majority of these birds exhibit a marked confidence in man there are some individuals that seem to fear him or, at least, show a strong tendency to shun his presence. In its temperament the Redbreast is somewhat fickle and vacillating. This character is evident even in its nesting habits.

Though bold and pugnacious, it does not appear that the males often give battle to each other for possession of a mate. Their solitary habits would preclude such battles. But once they have selected a breeding locality and built their home, they exhibit much resolution and in a most determined manner resist the intrusion of all other birds.

Many stories have been written to illustrate the sagacity and intelligence of the Redbreast. One tells of an individual which, during a winter, fed regularly at a certain house. One day he found a sparrow feeding there. Vehemently attacking the intruder, he drove it away. The sparrow, however, called several of its relatives and with their assistance drove the Redbreast from the food. Not to be conquered, the Redbreast, on the following day, brought with him a crow whose strong beak was much too formidable a weapon for the little sparrows and they



FROM COL. CHI. ACAD. SCIENCES.

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ROBIN REDBREAST.
(Erithacus rubecula).
⅘ Life-size.

were routed. From that time the Redbreast and the crow held the field against the sparrows.

The pugnacious character of the Redbreast is well illustrated by the following incident: "A gentleman once placed a stuffed Robin by a window, to which a live pensioner of the same species was wont to come. The living bird flew against the glass with great force and with full intent. Here he could not do much more than to exhibit his anger. But when the bird effigy was placed outside, at it went the live Robin, pecking at its eyes and plucking out its feathers, in a most savage manner."

Though far from neighborly, the male is always very attentive to its mate. He seldom leaves her for any great length of time and never goes very far from the vicinity of his home. With his sweet voice he is constantly encouraging her with song during the whole period that she is sitting on the eggs. When the baby birds appear then he gallantly helps his mate to feed the little ones. This is no light task, for the number of young, if the full complement of eggs is hatched, vary from five to seven. The strong attachment of the male for its mate has been frequently shown by placing the female in a cage. She will be constantly attended by her free mate who will scarcely leave the immediate vicinity of the cage, even when people are present.

The Redbreast's home is not an elaborate structure, though neat and pretty. It is usually constructed of moss, leaves and small twigs and moderately lined with hair and feathers. Usually the site selected for the nest is naturally concealed by a dense foliage. If such a site is not obtainable, the birds will often conceal the nest by an ingenious arrangement of dry leaves. This interesting bird home may be placed among the exposed thick roots of shrubs or tree, or in a hole in a wall that is covered by climbing vines. It may be placed in thick vines that entwine a tree trunk, or in the thatched roof of an unfrequented outhouse. Not infrequently the thick branches of an evergreen tree are selected. Sometimes the oddest of places seem to best satisfy the whims of this little bird. A shot passed through the fore mast of Nelson's ship, Victory. This mast, the one against which the hero was standing when killed, was afterwards placed in a park and it is said the circular hole made by the shot was soon selected by a pair of Robins for a home. Bishop Mant has expressed in verse the nesting habits of the Robin. He says:

The Robin Redbreast makes its bower
For nesting in the vernal hour,
In thatch, or root of aged tree,
Moss-grown or arching cavity
Of bank, or garden's refuse heap,
Or where the broad-leaved tendrils creep
Of ivy, and an arbour spread
O'er trellised porch, or cottage shed.
So, as we pass the homestead round,
At every change of place the sound
Of Robin's voice salutes the ear,
Carolling to his partner near;
And with sure gaze the observant eye
May Robin's hidden home descry.

Not only is the Redbreast an interesting bird, but it is, withal, an exceedingly useful one. In the orchards, in the gardens, on the lawns, among the shrubs and flowers, everywhere this active and hungry bird devours a host of insects, many of which are injurious to vegetation and others that interfere with our pleasures. Caterpillars, beetles, moths, earthworms and flies are all dainty morsels that satisfy the taste of the Redbreast. When hunting upon the ground, it approaches its prey with rapid hops and seldom misses as it pounces upon it. When insect food is scarce, and at other times, too, Redbreast enjoys the crumbs of the dooryard.

Hasten, dear Robin; for the aged dame
Calls thee to gather up the honeyed crumbs
She scatters at the door; and, at thy name
The youngsters crowd to see their favorite
come.
Fear not Grimalkin! She doth sing "three-
thrum"
With happy, half-shut eyes, upon the warm
Soft cushion on the corner chair; deaf and
dumb
And toothless, lies old Growler—fear no harm,
Loved Robin! Thou shalt banquet bold with-
out alarm.

—Thomas Cooper, "Prison Rhyme."

GETTING ACQUAINTED WITH NATURE.

It is a great pity that so many persons never get acquainted with Nature, for she is one of the best and wisest of friends, one who can paint pictures for us and tell stories and sing songs and amuse and delight and instruct us and keep us young all our days. And yet many never look into her face or listen to her voice or take her outstretched hand. Perhaps they are waiting for an introduction. Fortunately a few of Nature's friends, who know her well enough and have the necessary art, have taken upon themselves this pleasant task of introduction. This is the great service of the Nature poets. Chaucer, Wordsworth, Cowper, Burns, Emerson, Whittier and the rest are intimate friends of Nature and have introduced thousands to her friendship. But their introductions are almost too formal and finely phrased to succeed with everyone. So the naturalists have had to come to their assistance. Good old Gilbert White of Selborne, introduced thousands, in his quaint homely way. John Burroughs, in his genial, familiar fashion has done great service in this capacity. So have Thoreau and dear old Isaac Walton and Jeffries and Bradford Torrey and Rowland Robinson and Henry Van Dyke and scores of others.

And yet, in spite of all these kindly and good-natured go-betweens, the great majority of mankind, to their indescribable loss, have not even a speaking acquaintance with Nature. A few, to be sure, have formed an acquaintance which has ripened into friendship, without any introduction, which is after all, perhaps the best way. But these are rare. Even those of us who think we are on pretty intimate terms with Nature really know but little of her wonders and her ways. We know a few of the more familiar birds and flowers, have a dog or cat that we fraternize with, and can tell a sunset when we see it; but that is about all. We need to pursue our acquaintance further to develop it into a warm and fast friendship. To do this we must sharpen our eyes and our ears and our wits and enlarge our hearts. It is really amazing how naturalists make friends with Nature's children whom we never think of as having any possible relation to ourselves.

Dr. James Weir, Jr., author of "The Dawn of Reason," has some very interesting stories of friendships with animals and insects. Among others he tells of a wolf-spider with whom he struck up an acquaintance during an illness. This spider became so tame that she would crawl upon his finger and allow herself to be brought close to his eyes so that he might watch her movements. When a stranger came into the room she would run and hide. Like so many animals, she was fond of music and could be enticed from her hiding place by low soft notes, while quick sharp sounds drove her away. A spider might not seem to be the most desirable of friends, but it is hardly more repulsive to the ultra-sensitive than Browning's toad which used to follow him about the garden so affectionately. It is singular, in some respects, that women, who have as a rule gentler hearts toward animals than men, should be so timid in the presence of mice, as well as of many insects.

A few gallant women, however, have shown themselves undismayed in the presence of a mouse, even of several mice. Indeed, Miss Ada Sterling has written that she has gone so far as to give concerts for mice, gathering them about her as she sat at the piano by playing gentle strains that answered to their own nature and liking. She does not tell us, however, whether she dared rise before having played some more stirring tune to frighten them away.

Among Dr. Weir's pets he tells us of

another, more attractive to the fancy than his spider. This was his pet locust called "Whiskers" that lived in his room all her life, having been reared from an egg. This is his delightful account of her: "She is quite tame and recognizes me as soon as I approach, often hopping two feet or more in order to light on my coat sleeve or out-stretched hand. The first thing she does after reaching my hand is to seek my little finger and try her jaws on a diamond ring. The diamond seems to puzzle her greatly. She sometimes spends several minutes closely examining it. She will stand off at a distance and pass her antennae over every portion of it. Then she will come closer and make a more minute examination, finally essaying another bite with her powerful jaws. A great water-drinker, she evidently thinks the stone is some strange kind of dew-drop, hence her persistent efforts to bite it. "Whiskers" has developed canabalistic tastes, for the hardened skin around my finger nails is a favorite morceau which she digs out with her sharp jaws and masticates with seeming delight. She nips out a piece of skin, cocks her head on one side, and looking at me with her clear emerald-tinted eyes, her masticatory apparatus working like a grist-mill, she seems to say, "Well, old fellow, this is good." She passes most of her time on a bit of turf, in a box on my table, where the sun shines bright and warm. She is fond of water, however, and makes frequent excursions to the water-pitcher across the room. How she discovered that it contained water is more than I can tell, but she did and visits it often. It is in her habits of bodily cleanliness, however, that "Whiskers" outshines all other insects. I have watched her at early dawn and have always found her at her toilet. This is her first undertaking, even before taking a bite to eat. She makes frequent toilets during the day, and it is her last occupation at night before sinking to rest on a blade of grass."

If such little unnoticed members of the animal world are so interesting, how much more so the higher animals. Ernest Thompson Seton has opened our eyes to the inner lives and individualities of the wild animals and the birds and Dallas Lore Shrap has taught us how much of this curious and fascinating life one with sharp eyes may see even in the familiar places about his own home. Shy as are these fellow creatures one may often strike up quite an acquaintance by showing friendliness and discretion. Bradford Torrey tells us how he formed a friendship with a vireo who became so accustomed to him that she would allow him to approach and caress her as she sat upon her nest. That is as fine, in its way, as to have a personal acquaintance with the President or a member of the Royal family.

But the plant world is as well worth knowing as the animal, and much easier to get acquainted with, for the flowers and plants and trees never run away, and they are almost all friendly and gentle. Every one ought to be on terms of personal affection with some noble tree. It is a friendship worth cultivating. So is that of the flowers. The friend of Nature may well address her as Wordsworth did the Daisy:

And all day long I number yet,
All seasons through, another debt,
Which I, wherever thou art met,
    To thee am owing;
An instinct call it, a blind sense,
A happy, genial influence,
Coming one knows not how, nor whence,
Nor whither going.

JOHN WRIGHT BUCKHAM.

BIRD BATHS IN WINTER.

While strolling through the orchard one day I came across a novel scene in birddom, a band of tufted titmice and tree sparrows in the act of taking a winter bath. It was the eleventh of March and there had been snow and sleet the day before, but the morning's sun had melted it. A slight depression in the surface of the ground had collected sufficient water to form a shallow pool, and this was the watering place.

This incident occurred about one o'clock and I happened on the scene just in time. A small party of tufted titmice and tree sparrows were congregated about the pool preparatory to a dip. Three titmice made the first move, yet seemed loath to plunge into the chilly water. Indeed their reluctance reminded me very much of a child that dreads its bath. Hopping cautiously along the edge of the water and chirping querulously the while, they finally overcame their aversion and waded boldly out to the center of the pool and began their ablutions. Apparently after the first plunge they enjoyed their bath, in spite of the chilliness. This tempting sight seemed to cause the tree sparrows to follow the tits' example, for they joined them in the water, and then such splashing and throwing of water right and left! After a few moments, all took flight to the apple trees to dry themselves in the sun, and with many vigorous shakes and preening of feathers their toilets were finally completed.

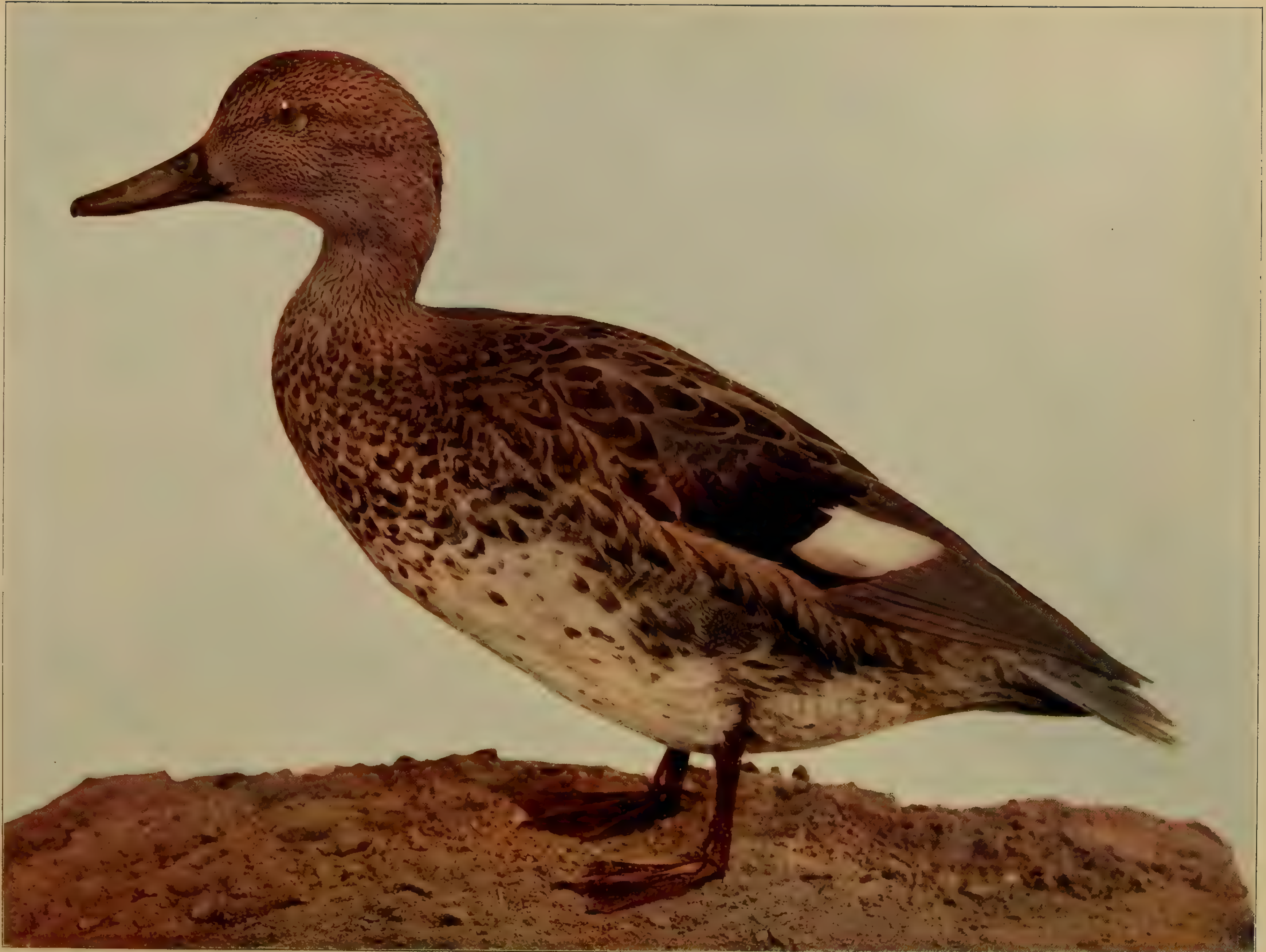
I witnessed another bird bath even more entertaining on account of the environment. It is my custom to spread a daily feast for my feathered friends in a place that commands a ready view from my window. This second bath took place at the feeding grounds the day before Christmas eve of the present winter. There was several inches of snow on the ground and the mercury had reached twenty degrees below zero only three days before, but now it was thawing and water was standing in sheltered places that had received only a light snowfall. Miniature pools had formed at the bases of the trees and shrubs in the yard, and were being utilized by tree sparrows and juncos for bathing places, and while these hardy little creatures were taking their cold plunges, apparently without a shiver, others of their kind, in company with three goldfinches and a pair of cardinal grosbeaks, were partaking of the noonday spread under a maple tree; a downy woodpecker was diligently inspecting the bole of the tree, and merry-hearted chickadees were performing acrobatic feats among the branches above. All in all, it was a most beautiful and animated scene amid the snowy surroundings and will not soon be forgotten.

ADDIE L. BOOKER.

THE OLD BLUE CRANE.

Grotesque and tall he stands erect
Where the reed-riffle swirls and gleams
Grave, melancholy, circumspect,
A hermit of the streams.

ERNEST M'GAFFEY.



FROM COL. CHI. ACAD SCIENCES

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GADWALL.

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THE GADWALL.

(*Anas strepera.*)

The Gadwall, Gray Duck, or Creek Duck, has a very extensive range, including the temperate zones of both the eastern and western hemispheres. It inhabits the British Isles and breeds in Norfolk County, England. In Holland it is abundant, and in the fall is one of the most common ducks to be found in the market.

In North America the Gadwall is confined chiefly to the interior and Florida and Georgia are the only states on the Atlantic coast in which it occurs in any numbers. Along the Pacific coast they are common residents of California. Many of these ducks pass the winter about the Gulf of Mexico, in Central America and in the West Indies. It is quite common throughout Illinois, is rarer in Indiana, and in the upper and lower peninsulas of Michigan it is found in considerable numbers. It is likely to be found breeding anywhere within its range.

The general appearance and habits of the Gadwall are quite similar to those of the mallard, teal and widgeon. The latter name (widgeon) is indiscriminately applied to three species: the Gadwall, the baldpate or American widgeon, and the European widgeon. All three varieties inhabit both the old and the new worlds. The females and immature birds of the three species are often confused with each other. This is especially true of the baldpate and European widgeon.

The adult male Gadwall measures about twenty inches long. The head and upper neck are whitish, thickly streaked and speckled with brown and black. The lower neck and breast are black, with the feathers irregularly tipped and streaked with white, producing a scaley effect, which becomes less pronounced on the shoulders and sides, where the markings become wavy, are finer and more numerous. The back is gray and the feathers are margined with rufous brown. The belly is white, or faintly shaded with gray, the tail is black. The wing coverts are chestnut and black, with the speculum white. The feet are orange yellow; the eyes are reddish brown and the bill is bluish black; the tail is short and pointed.

In the female the black and white are less pronounced and are replaced by various shades of brown. She may also be distinguished by her smaller size, and the scarcity of chestnut on the wing coverts.

The dress of the Gadwall appears very sober when compared with our other ducks, the majority of which are noted for their beautiful plumage. For this reason it is much less frequently observed than are others of the duck tribe. As it is often a common duck in localities where its presence is unknown, little has been written regarding the nidification of the Gadwall, principally for lack of observation.

The Gadwall is found in company with other waterfowl during its migrations, at which time it inhabits the flooded prairie regions of the northwest in large numbers.

Its food consists of both animal and vegetable matter, which is obtained from the surface of shallow lagoons and ponds. While feeding, the body is often partly submerged, as the birds probe about under the water. It seems to feed throughout the day.

Authorities differ regarding the note of the Gadwall, but in my experience I have found them rather silent, occasionally uttering a few shrill "quacks" similar in tone to that of the mallard.

GERARD ALAN ABBOTT.

TWO PET CROWS.

One warm night two years ago last June, as Cousin Fred was playing peggy with a boy friend, he heard a loud cawing noise out in the woods near his home. Dropping his peggy stick, he said to his friend: "Say, Joe, I believe there's a nest of young crows out there. Come and see." They left their game and went out to the edge of the woods and there they saw a mother crow teaching her three little babies how to fly by pushing them out of the nest, one by one. It was all right to treat the first two crows in this way, but the third crow was not ready to fly yet and she fell to the ground near Fred.

Now, Fred is a little boy who is fond of telling everything he knows and so, of course, he told his big brother Harry about the nest of young crows in the tall pine. When Harry heard the news he ran to the woods and climbed up—"shinny up," the boys say—to see the nest, but that was not enough. Those crows must be tamed, and as they were learning to fly, Harry knew he would have to get them soon.

As it was getting dark the boys came home and brought with them the young crow which could not fly. She was put in a wire cage, after the bottom had been covered with hay, and was named Mary.

The next morning the boys found Mary dead in her cage, so they buried her in the corn field. After breakfast Harry went to the woods to get the other crows. Mother Crow was not at home. She was probably hunting worms for her dear ones. Harry climbed up the tree and secured the birds. They were placed in the same wire cage. The larger was named Billy McGee, the smaller Billy McGaw.

For the first two or three weeks, the pets were fed on soaked crackers and worms and they seemed to thrive and grow fat. In July they needed more food and became very fond of meat—especially beefsteak.

One morning in August, Fred and Harry were awakened by a racket in the orchard. The boys went out to see what was happening and what do you suppose all the fuss was about? Both Billys were in a pear tree and in an apple tree nearby was a flock of wild crows sputtering away as if they were crazy. They did not fly away when the boys appeared, but began all the louder, "Caw-caw-aw-caw!" After awhile, Billy McGee and Billy McGaw flew down on Fred's shoulders because they were hungry and because Fred had always fed them in the morning. The wild crows finally flew away and the boys returned to the house.

The crows grew wiser as they grew older. Let me tell you some of their cute ways. The boys slept in an east chamber, their bed facing the east window. Very often the crows would go to the eavesspout just over the east window and about five o'clock in the morning they would begin their crow talk, which, of course, awoke the boys. Evidently the crows thought it was time for the boys to get up—perhaps it was.

Once Fred went to the ice chest in the shed to get some beefsteak for Billy McGee, not knowing at the time where the other crow was. He took the meat and went outdoors to feed Billy McGee, forgetting to shut the ice chest. When he went back to close it Billy McGaw was in full possession of everything and was just ready to fly away with a piece of meat twice as long as his own length.

The crows were allowed the privilege of coming into the kitchen until one day Uncle's glasses were missing. One of the crows had hidden the spectacles in the flower garden.

The boys had many money offers for their crows but they never sold them, nor did they keep them through the winter.

One morning in August, Fred found Billy McGee dead underneath the elmtree where the crows always slept at night. Billy McGaw was shot in his right foot, so badly that the boys feared they were going to lose him, too.

But Billy second lived a few days longer. Fred put some cotton cloth soaked in bran and warm water on the wounded foot. With his other foot, the crow scratched off the rag and looked up at Fred with a weak "Caw," which seemed to mean, "I don't want that on." Billy McGaw's wound was too much for him. He died August 23, 1899.

Should you go out to the orchard, near Fred's home, you would see the slab (not a marble slab, but a shingle) dedicated to Billy. That day, August 23, 1899, a sad funeral was held. Fred put Billy in an express cart—called it the hearse—he and his little friend Joe were the horses and sister and her friend Ruth the mourners. Billy was buried with ceremony, beneath the "minister" apple tree. Flowers were put around the headstone, which was the shingle and on which sister wrote:

"Here lies poor Billy the Crow,
Who died Aug. 23, 1899. God bless poor
Billy."

As this is a true story you must believe that sister and Ruth (the boys didn't for boys never do such silly things) shed many tears over Billy McGaw's grave.

SUSY CUTTER.

HOW WE SAVED MOTHER ROBIN.

(A TRUE STORY.)

One afternoon in the early spring, two little boys, Herman and Homer, were lying out on the fresh, green grass. How good it seemd after the long, cold winter! Mamma had read to them till they were tired of keeping still any longer, and while thinking what next to do, Herman said: "Oh, let us take off our shoes and stockings." But mamma thought it was too early in the spring for that, but finally permitted them to remove their shoes.

While they were running around in the clean grass, Herman heard a great noise down in the meadow where one of his robins was sitting on four beautiful eggs. (I call it his robin because it was one of those he had been watching for some time.) She had been very early about her nest building and was sitting on her eggs before most robins had finished their nests. Forgetting the stones and blackberry vines in the way, Herman rushed off to see what was the matter, followed by mamma and Homer. At first they thought the robins were fighting, then Herman said "It's a hawk!" and how he did run to get there in time to save his robin!

The old hawk had pounced upon her siting on her nest, and was trying to carry her off. You see, it was so early in the season that the leaves had not come out, and she was easily seen by the hungry old hawk. He was so much frightened by Herman's screams that he had to drop the robin before Herman reached there.

Poor mother robin's wing was broken, so Herman carried her up to the house and put her on a soft little bed, but very soon she began to hop round and seemed so lively that when night came they carried her down and put her under her own tree, but her nest was on such a high limb, Herman was afraid she could never reach it again. The next day the robin could not be found, but the third day she was sitting on her eggs again. How she got up there Herman could not know, but wasn't he glad he saved her life?

MARY C. W. SMITH.

THE HARRIS'S SPARROW.

(*Zonotrichia querula.*)

Dr. Coues has said of the Harris's Sparrow that it may be regarded as the most characteristic bird of the Missouri region. Its range is mainly confined to the central United States, reaching from Illinois on the east to Middle Kansas and the Dakotas on the west. North and south its range extends from the interior of British America to Texas. During its migrations it travels in small flocks which suddenly appear in patches of shrubbery where it feeds for a time and soon disappears as quietly and suddenly as it came. It enjoys the undergrowth and shrubs that are found in ravines and along the banks of streams. An interesting habit, that does not fail to make Harris's Sparrow a conspicuous object, is that of perching, when disturbed, on some high branch of a shrub in order that it may obtain an uninterrupted view of its surroundings and of the intruder.

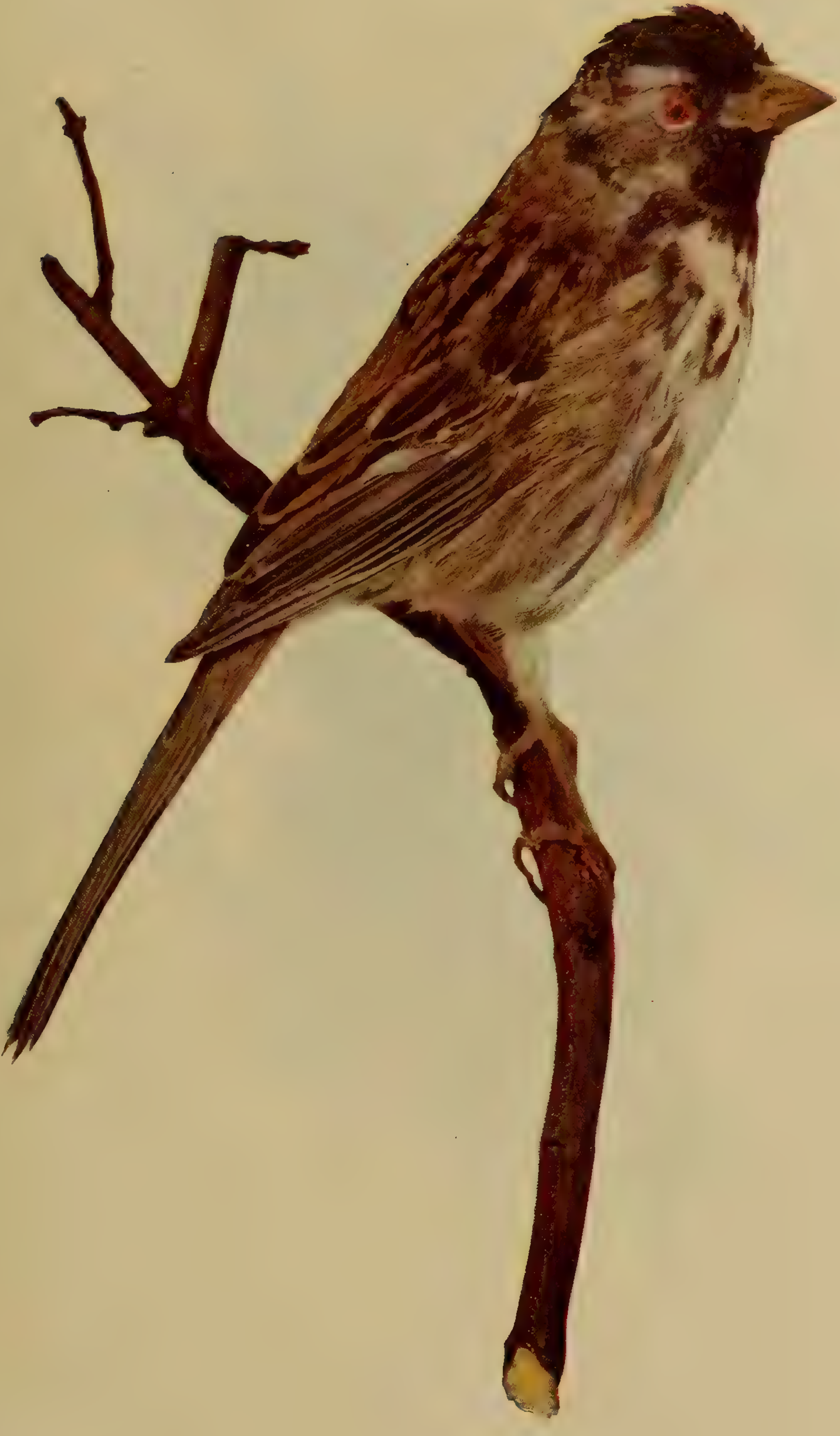
An observer, who has studied the habits of the species as it passes through the state of Iowa during its migrations, says: "This beautiful Sparrow is one of the commonest of the Fringillidæ that pass through the State in spring and fall, associating at such times with the other sparrows and finches and frequenting similar haunts. Its notes in the fall are a simple, loud chirp, not distinguishable from that of the white-throated sparrow and occasionally a low sweet warble. In the spring it has a curious song, beginning very much like that of the latter bird but ending in a few harsh, drawling notes, sounding like a faint mimicry of the scream of the night hawk and totally unlike the first part of the song."

This Sparrow seems to have a happy disposition. Colonel Goss says: "They commence singing early in the spring, and upon warm, sunshiny days their song can be heard almost continually, as one after the other pours forth its pleasing, plaintive, whistling notes, in musical tone much like the white-throated sparrow, but delivered in a widely different song."

Mr. Nehrling observed it in Texas, during the month of November, where it was associated with juncos, white-crowned and field sparrows, in flocks consisting of thousands of individuals. He caught several of the Harris's Sparrows and confined them in cages. They became tame and he fed them on various insects, kaffir corn and canary seed.

This Sparorw is of large size and when dressed in its summer plumage it is a strikingly beautiful bird. The glossy black of its crown and throat are made prominent by the "bright coat of the usual sparrow mixture of colors" that covers the remainder of the body.

But little is known of the breeding habits of this Sparrow. Its nests are built in the northern part of its range, probably only in the interior of British America. The only authentic record of its breeding range is that of Mr. Edward A. Preble, who found an adult male and female in company with young just from the nest, at Fort Churchill.



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HARRIS'S SPARROW.
(Zonotrichia querula).
Life-size.

THE FIRST ROBIN.

Robin Redbreast called his mate:
"Love, the days are growing long;
Northern snowbanks melt apace,
Northern friends await my song.
So, dear heart, today I'll leave thee,
When thou comest, I'll receive thee—
Cheer up, cheer up,
Julia Tealeaf,
Share my belief."

Northward then came Robin Red
Just as March passed through the door;
Never was a royal guest
Heartier welcomed, fêted more.
This the message that he's bringing:
"Flowers are coming, birds are winging—
Cheer up, cheer up,
March has left us,
Nor bereft us."

So he sings, but ever watches
That his lady he may see,
And his voice, on her arrival,
Shows a tone of ecstacy:
"Now, dear love, at last you're near me;
Ah, my heart did greatly fear me!
Cheer up, cheer up,
Julia Tealeaf,
What a relief!"

—Grace E. Harlow.

THE ROBIN'S SONG.

A SPRING TIME SATIRE.

It was spring. I made the assertion with all boldness. Socrates could scarcely have been surer of his "sign" than was I of mine. When had it failed? It had survived a probation of ten years. What other index of the seasons has in your experience surpassed that record? I felt that there was reason for conceit. For spring, I had early learned, was the veriest iconoclast, a veritable (if I might invent and add and be forgiven by the traditionally gentle reader for hurling at him the rhetorical somersault) semeioclast or—to translate into unvarnished vernacular—a "sign smasher."

What signified the calendar? The vernal equinox was an arbitrary date. It might mark high winter. To fall asleep on the identically corresponding winter night of each successive year and next awaken to the spring was pretty fancy but purest fiction. The sign failed. At best it was a mathematical convenience.

Then, too, there were the scarcely less conventional robin and blue-bird, the symbols highest perhaps in boyhood's esteem and possibly in general popularity. Their mere presence, however, soon came to count for little enough as a season indicator. As far north as latitude 38° 35″ I had found the red-breast for twelve successive months. In the mild winters he haunted the timber, strangely silent, but—with equal strangeness to some perhaps—in troops. The blue-bird, famed but fabled "color bearer of the spring," had become a better harbinger of cold. Only in the autumn was he notable by numbers and boldness and his sweetly querulous farewell, lisped from fence or roof or from high in air some frosty morning on his passage south, was a characteristic note of the waning year. So failed again the signs, alike the most familiar and by associations—alas!—the dearest.

Had I been a girl I might have dated the season sentimental by the Johnny-jump-ups but were not Johnny's chief virtues those of his name, ubiquitousness and a certain virility? The feminine flowers were earlier, more delicately beautiful. Johnny, too, like the red-breast and the blue-back, was a loiterer. Within the limits of the robin's twelve months' stay specified above I had glimpsed his saucy, purple face on sunny uplands after mid-November frosts and hoped to surprise him afield some Christmas day.

Unnamed as yet and worthy only as the child's first favorite was that bane of lawns, the dandelion. But, aside from graver faults, it was even more nearly perennial than either violet or robin. Indeed its gold was only gold in winter months when it changed not, by its usual perverse alchemy, to seed-silver.

Plainly then we must have done with popular indications. Only expert testimony could be accepted. What said the aesthetes? Their names must be Blank but they were also Legion and they all had it all worked out for us. Nature's clock is wound and working; the cuckoo pops out and creaks his wooden song; this bird appears; that flower blooms; and spring is on! By dictum, for example, the first feathered prophet of vernal days is the purple grackle; their first floral precursor, the hepatica. This is certainly definite enough. Would that it were as definitely certain. But the iris-coated trooper of the swamps ranges over frozen wastes. From the reedy meadows of December drifted deep with snow he may at times be flushed. Prophet he is but too remotely so. Nor does the virgin pink of the hepatica smile on us of the sparsely timbered west. A commoner she is not, but a high-born lady, a recluse. Might they not both better stand as types of sign failures, the former as the sign too early, the latter as the sign too little familiar? To these lower terms at any rate may be reduced nearly all the symbols of the season. That so-called first blossom of the spring, the skunk-cabbage, uncanny monk that he is, may lift his mottled cowl in November or January as well as March. Besides, his habitat, all his associations are—to phrase it lightly—unæsthetic. Buds are swelling the winter through and have been formed perhaps for months before. Snowdrops and crocus disdain the turn of the year to shiver in the snow. Their debit evidently runs: "To Spring so much"—and it is little enough—"caloric received." Their standard of measure is the thermometer; their unit, a few notches above winter warmth. The horned lark I have found over four eggs in her ground nest on the seventeenth of March, when ten above zero was the highest register of heat throughout the day. I have heard the meadow larks flute their sweetest, fullest calls over an unbroken sheet of winter white. Our other gay deceivers of the spring we cannot even catalogue. The snapping cones and the sugar snow; the clamoring crane, the noisy kildeer, the game fowl—alike the "honkers" and the "quackers" and the whistling teal or snipe; the various docks, the shepherd's purse, the willow catkins, the alder pendants, and the dancing Easter sun; the peeping hylas, the hoarser frogs, the chilled or drunken but cheery bees, and the mourning dove; the trailing arbutus, spring beauty, blood root, dutchman's breeches, the anemones. And so forth must include the many, the signs scientific, the signs superstitious, the signs jocose the remainder of the signs aesthetic and popularly prognostic.

Shall we then despair, cease to be symbol worshipers, say there is no single certain signal of the season's advent? Must Aristotle's proverb be our simple creed or rather discreed, that not one swallow makes a summer? Was the Greek idea correct that the genius of spring was Persephone, a goddess, a maiden, the gender feminine, and as such was she to be undated in her coming, a sweet-heart to be loved, but never won, the representative of a religion for worship but not for realization? Are the seasons like the perfect life, a growth, a process, a state unmarked, perhaps, by definitely characteristic and transitional acts? Must we leave unanswered when I reached manhood, when you fell in love, when he became converted? Can we only say: "It matters not. The fact remains. She comes—I know not when?" There is an alternative. We may disregard the popular signs. With human conceit we may ignore the declaration of authorities. We may set up our own pet sign. Do we not at any rate? And so I said that spring had come. I was satisfied with my witness. After failures untold I had found a sure thing. It had met the test for a decade. It was familiar, national in its familiarity and—if you will admit it—unfailing. It was a song and not a presence merely. It expressed a mood, a mood of ecstasy, the ecstasy of spring. It was the robin's song.

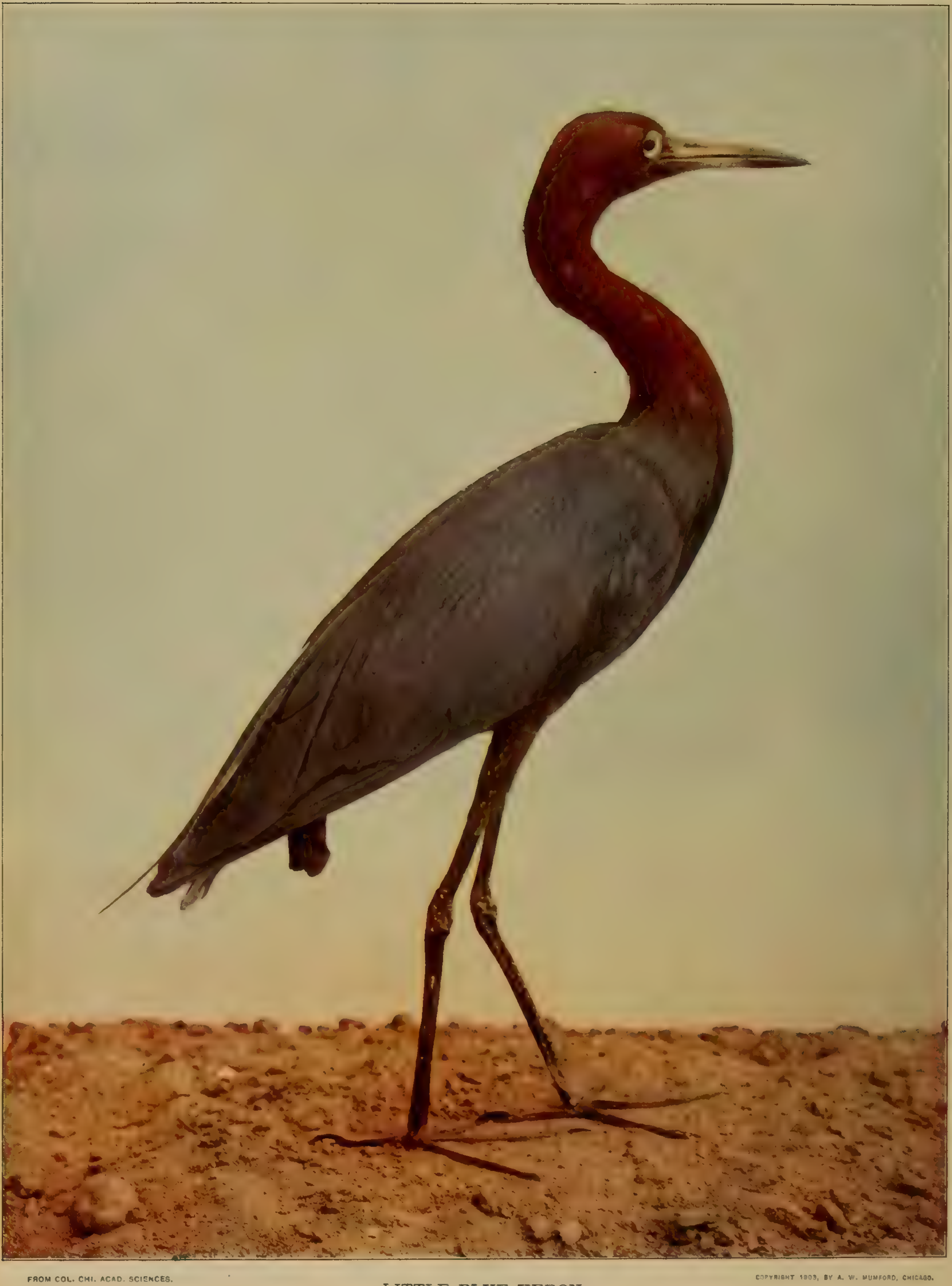
Too early my prophet often came. I like him for it. Too early he never sang—in that decade. Some of his many calls he sadly voiced over a white earth, but not his full, heartfelt rhapsody to spring. That paean there was no mistaking. He was wiser than the meadow lark. His message meant to my interpretation: No snow, no more snow, but showers and sun and apple blossoms, nest and fruit. Other indications I noted but for this I waited. It was my favorite ode to spring, a lover's sonnet, a marriage hymn. In summer it was reminiscent, heard only after rain and then it passed like the passing of Arthur until "the new sun rose bringing the new year."

In the tenth year of my sign toward the dawning of the eleventh my sleep was broken—an unusual occurrence. It was the robin's song. Half awake, I felt my face relax. For the first time I realized that it was firm with the iron of years. I murmured a prayer of thanks. Spring and all it typified of life and health and love and hope as yet remained. It was the light of a new day, a new year, a new decade, a new century even. It was again "land after sea," the winning of a wish, a prayer, a boon. What might it not presage? Might not I too sometime awaken to the larger morning, the spring perennial, with something of the robin's ecstasy of song? I have heard the woodthrush in a midsummer forest solitude at late twilight; in a strange land at midnight I have thrilled to the nightingale's lament; but the robin's song meant more to me. It always brought me nearer tears. What memories it recalled! A happy boy in the old home crept barefoot at dawn under the cherry tree to listen open mouthed. Later the robin sang to lovers. Again from the same tree he sang for two who listened arm in arm with parted lips and dimming eyes; for he sang still of love but also sang of nest and—nestling. Once again the song rang but it was for one only and it floated out over the old church burying ground and sight could only reach the singer by a glistening path of tears. I hurriedly dressed. How I longed for a tramp through the country. I knew what I should find but the joy was in the finding. The maple wands by the river side were bursting into distant flame. The willows were unfolding their fluffy catkins. Now the tree sparrow had a song. The chicadee was piping that sweet call with which we are familiar in spring but the humble source of which we rarely dream. Meadow larks fresh from the south were flitting across their old haunts chary as yet of their varied calls. In the river thickets the cardinal is whistling. I hear the plash of the first turtle. Greenwing and bluewing, mallard and red-head and canvasback, blackjack and sprig are on the streams and in the lakes. A high hawk, perhaps, adds dignity to the idyll. But the town has its suggestions of spring. My transplanted hepatica is unfolding white and downy curls, each floweret cased in its separate sheath of leaves. Crocuses are in bud. A solitary snowdrop in its modesty has almost escaped us. It is in bloom, the year's first flower. Bluebirds are twittering overhead. The air is delicious. The thermometer registers sixty-eight. There is the Chaucerian smell of earth and sun, the aroma of early bonfires. Yes, and here in this cedar are half a dozen golden-crowned kinglets. May we not hope to surprise other migrants, to hear perhaps the flicker's merry chuckle, to flush the solitary bittern from his swamp, to get a glimpse of that other ship of state the big blue heron as he sails through space on his passage north, to feast our eyes possibly on the flaming redbud lowlands of some forest solitude? Work keeps me in all day but I have arranged for tomorrow. I shall take my gun and note book. I may get some ducks. I shall woo the spring. The Greek myth will be mine. I know the trysts. The evening is a noble sequel to the day. Windows are open. I hear the passing of a migrant or two overhead. The wind is south. A cloud and distant thunder from the same quarter mar the glories of a full moon. At eight my writing is interrupted by the honk of geese. My pulse thrills a little in anticipation. A full bag is only second to a full note book. From eight to nine I count sixteen of these honking flocks. The arc lights of the little town seem to attract them. Scattering shots mingle with the thunder. At nine a gentle rain begins to fall. The bottom lands a half mile distant are discordant with wild fowl. The flight of noisy flocks is now incessant until eleven when I retire. As I lie in bed I hear more and more dreamily the deep nasal quonk of the big ducks, the monosyllabic whistle of the teal, the weird, uncanny honk of the brant and the Canada goose. The patter of the gusty rain makes me sleepy. My last memory of the night is of an impudent squad of ducks that seem to fly just past my window. They were quacking vociferously and were trailed apparently by an unfortunate or laggard whose dissatisfaction at the swift gait of his companions was expressed yet more noisily in hurried, intermittent grunts. I vaguely wondered how these birds timed their migration. They all came from the north. How did they all slip past on their first trip unnoticed? At any rate they were in consonance with my sign. I had waked to the robin's song. I fell asleep to the music of rain and the clamor of wild fowl.

* * * * * * * * *

Again my sleep was broken and restless. Dreams were many and varied. At length the morning dawned. Something was wrong. Where was the robin? The wind was north. The ground was white. Snow was already six inches deep. The blizzard of the year was on. For three days it raged. The wind maintained a howling velocity. Drifts grew to the depth of six, eight and even ten feet. Two other storms little less severe followed within the month. March comprehended winter. Some mathematical croaker claimed that the month registered but three sunny days. One of these evidently I shared with the robin and with spring. Aristotle was right of course and this is my last effusion on the robin's song. "Not one swallow makes a summer"—nor the best of signs a spring.

J. VALLANCE BROWN.



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LITTLE BLUE HERON.
(Ardea caerulea).
$^{2}{}_{5}$ Life-size.

THE LITTLE BLUE HERON.

(*Ardea caerulea.*)

Far up some brook's still course, whose current mines
The forest's blackened roots, and whose green marge
Is seldom visited by human foot,
The lonely heron sits, and harshly breaks
The Sabbath silence of the wilderness;
And you may find her by some reedy pool,
Or brooding gloomily on the time-stained rock
Beside some misty and far-reaching lake.
—Isaac McLellan, "The Notes of the Birds."

The Little Blue Heron is burdened with a number of common names, some of which are local and mean but little to one not resident in the district where they are used. It is often called the Blue Egret, and in some parts of Florida it is called the Bobby. The latter name is not unmeaning to those who have seen it standing in the water, sphinx-like, patiently waiting for its prey to come within striking distance. When resting, too, it stands like a statue with its neck drawn back so that the head rests upon the body between the wings. The young are white and are called Little White Herons.

The range of the Little Blue Heron is quite circumscribed. It is a native of northern South America, Central America, the West Indies and the temperate regions of the United States, nesting as far northward as the States of Virginia and southern Illinois. After the breeding season, it wanders northward and has been found in Nova Scotia. Nebraska seems to be the western limit of its range. It is very common on the lakes and streams of Florida and the other states bordering on the Gulf of Mexico.

Nature did not adorn this Heron with the beautiful aigrette plumes of its relative, the snowy heron, and it has thus escaped the ruthless slaughter of the hunter who kills only for the gain that results from the demands of a cruel fashion. The white young birds are sometimes mistaken for snowy herons, but may be easily distinguished by their yellow legs and feet, the legs of the latter heron being black.

The Little Blue Heron is a true fisherman. It neither moves or utters a sound while watching for its prey, and it knows that it is best not to fish in company. In its home life, however, it is not a hermit. It nests in colonies and passes a social life with its fellows. "When undisturbed in their rookeries, each bird seems to have something to say and the result is a strange chorus of croaking voices." The flocks may consist entirely of the adult blue birds or of both the adults and the white young. Occasionally a flock contains only the young birds.

The cypress swamps of the Southern States are the favorite resorts of the herons. Some of these swamps contain a large number of rookeries, not only of the Little Blue Heron builds its home in the herons. Unlike the great blue heron which nests in the tops of tall trees, the Little Blue Heron builds its home in the bushes over or near the water in which it seeks its food. The nest is a crude platform of sticks. It is probable that the birds return to the same rookeries year after year during the breeding season, and though a pair may not use the same nest each season, they simply repair an old platform by the addition of a lining of new twigs.

ANIMAL EATING PLANTS.

"What do you think, Grandpa," all the children cried at once as they rushed into that good gentleman's sitting room one morning.

"Well," said Grandpa, taking off his spectacles and leaning back in his chair, with a smile, "I think a number of things. What would you like me to think just now?"

"Oh," exclaimed Edith, somewhat embarrassed by this answer, "we've just been to the Park and we've seen some of the queerest things."

"And what were some of the queer things?" asked Grandpa.

"Pitcher plants. We saw some pitcher plants," they all exclaimed.

"Pitcher plants? That is very interesting. You must tell me all about them."

"The old gardener was standing near us and he called them side saddle plants, and said they came from New Jersey. He said they grew in many other places, too," said Jack.

"Yes, and he explained everything about them," said Harry. "He showed us that the large rib in the middle of the leaf was swollen, and that the edges of the leaf come together to make a regular pitcher. The pitchers were half full of water, with bugs and caterpillars and all sorts of things floating in them. The gardener told us to look at the outer sides of the pitchers, and when we did, we saw honey oozing out. He told us that some kinds pour out honey all summer."

"Did you ever see a pitcher plant, Grandpa?" asked Edith.

"Yes, many times. Nearly all large hot houses have some. All that I have seen had lids. Had these?"

"Some of them had."

"Did you notice the honey on the lids?"

"Yes," answered Jack, eagerly, "and there was a little path on the outside of the pitcher leading from the bottom to the top, and there was honey all along this path and around the pitcher's mouth to attract insects. They fly to it, or creep up the little path for it."

"Did the gardener tell you to examine the inside, too?" asked Grandpa.

"Oh, yes," answered Harry, "after the insect has climbed to the top of the pitcher he steps down to the inside wall to a part which is smooth and glassy, and is made of tiny things which are wide above and pointed below, so that they help the innocent little creatures to go down, but make it very hard, almost impossible for them to come back. Just below this is another smooth part, with juice standing out on it; then below it is a part that is covered with coarse hairs, pointing downward. You see everything makes the poor little things go down. They lose their footing when they travel upon the slippery parts, and then are caught by the stiff bristly hairs, which keeps them from going up. The juice that is oozing out from the walls wets them, making them stupid and sleepy, so they drop to the bottom and die. In a few hours, the juices in the bottom of the pitcher gradually eat them."

"The gardener told us that he had found caterpillars, crickets, bees, blue bottles, slugs and all kinds of tiny creatures in these pitchers," said Edith. "He said he took seventy-five bugs and other things from one, all at one time, and thousands and thousands of ants are eaten by them."

"Yes," remarked Grandpa, "they have wonderful appetities, something like small boys," he added with a sly laugh.

"This is the first time I ever heard of plants eating animals," said Edith. "I always knew that animals ate plants, but I didn't know that the tables were ever turned. Are there many plants of this kind, Grandpa?"

"There are a few others, but not many. Next winter when we go South to visit Aunt Mary, we can see a very interesting one in Eastern North Carolina. It is called the Venus fly-trap and is only found in the sandy soil near Wilmington."

"Does it look like the pitcher plant?" asked Harry.

"Not at all," was the answer. "It spreads its leaves on the ground in a rosette, and each little leaf has a broad stalk and is made up of two halves standing almost at right angles with each other. There are little spikes around the edges and the upper surface has three fine pointed hairs, arranged in a triangle on each half. If an insect alights on the leaf or touches one of the six hairs, the hair bends, then, if it jostles this hair a second time, the two leaf halves clap together at once, holding the insect between them. If the little prisoner is too small to be worth eating, it can creep out between the spikes or bristles along the edge, but if it is large enough to make a full meal, the two parts of the leaf clasp it closer and closer, the bristles on the edge interlace just as you interlace your fingers when you clasp your hands and there is no escape. As it is with the pitcher plant, the more the insect struggles, the worse it is, for it becomes more entangled in the honey, in the pitcher plant, while in the Venus fly-trap the struggling makes the leaves close faster. After this fly-trap has its prisoner securely fastened, it allows it to lie for a few hours, then sends out a juice which slowly eats it, leaving nothing but the shelly parts. There is still another plant of this kind," Grandpa continued.

"What is its name?" inquired Edith.

"It is called sun-dew, because its spoon-shaped leaves are covered and fringed with hairs having tiny, clear-looking drops like jelly on their tips. When the sun is shining on these drops, which are dotted all over the leaf, they look like dew-drops. This sun-dew is a fine thing for work, for it is so useful that the people of Portugal call it the fly-catcher, and hang it up in their cottages to catch flies."

"How does it catch them?" asked Harry.

"When a fly or a midge touches one of the leaves," said Grandpa, "it becomes entangled in the jelly. Then it struggles to get away. This makes all the hairs bend inward, so that the insect is carried to the middle of the leaf and kept there. A juice soaks into the body, kills it, and then draws from it all the food it needs."

"I remember another plant which feeds on animals," said Harry. "It is very different from these we've been talking about, though, for it is a fungus. Uncle Will told me about it last year when we were abroad. In the spring, when the salmon were going up the river, we used to walk down to see them every morning, and many of them behaved so strangely that I asked Uncle Will what ailed them. He said that they were in misery, and that made them rush about and rub themselves against anything they could to relieve their sufferings. He said they were often affected in that way when they were coming up the river, because floating around in the water were spores from a little plant, or fungus, called saprolegnia and these fastened themselves to the fish by little hairs they have on them. When the hairs on the spores have taken a good hold, little tubes grow out from the spores, something like the way a seed sprouts, you know, and they work their way through the flesh and over the whole body like a tiny vine. This bears more spores, which blow away into the water and work around there until they find something to which they can fasten themselves. You can see little patches of white over the fish's gill covers at first, then in a few weeks there are patches all over the head. These are soft and flaky looking and grow very fast when they are well started. The fish have to fight so hard to get up the river at all that they become very weak, and the water is so impure on account of there being so many fish in it, that their blood becomes poor and unhealthy. This is what the plant wants to make it grow well.

When almost half of the body is covered, the fish dies, but its enemy eats away until there is nothing more to eat.

"Yes, I have heard of that plant," said Grandpa. "You have all seen dead flies sticking to window panes, haven't you?"

"Oh, yes," they all exclaimed.

"These have almost always been killed in the same way that the salmon, of which Harry has just told us, were killed. The plant which lives upon the flies is a very near cousin of that which lives on the salmon, and, if you look closely at these dead flies, you can see the fungus, which looks like a soft, white mist. But, come, come, lunch has been ready for some time and we must not keep Mamma waiting.

ELIZABETH ROBERTS BURTON.

NESTING OF THE GADWALL.

The Gadwall is more southerly in its breeding range than most ducks of its genus. Although they nest commonly in Alberta, Assiniboia and Manitoba, a large percentage of Gadwalls breed south of the Canadian border. Near Los Angeles, California, the Gadwall has been known to lay her eggs as early as the first of April.

Among the small lakes of North and South Dakota and Minnesota it is one of the commonest of ducks during the nesting season. Northern Wisconsin and Michigan are the summer homes of the Gadwall, but it becomes scarcer west of the Missisipi River. In the above mentioned states this duck arrives from the South in the latter part of March or in April. During the month of October it departs from its breeding grounds, gradually wending its way southward as the cold weather approaches.

The Gadwall is usually a bird of the open country, such as the prairie regions of the northwest. It nests at Shoal Lake and Lake Manitoba, Canada. About Devils Lake, North Dakota, the Gadwall commences to lay her eggs about the first of June, sometimes earlier, and fresh "sets" are not uncommon up to the first of July.

The nest is placed near water, preferably on high ground, and generally concealed by tall weeds or brush. The parent bird sometimes selects a tuft of grass or clump of rushes in an open place, which would seem to offer very little protection were it not for the dull colored female who so closely harmonizes with her surroundings that she allows herself to be almost stepped upon before leaving her eggs. One writer refers to the Gadwall as sometimes nesting in trees, but I can find no records that verify his statement. Let her leave the nest voluntarily and so deftly will she conceal her eggs by covering them with down and grass that even the trained eye of the naturalist is often baffled while searching for the hidden treasures.

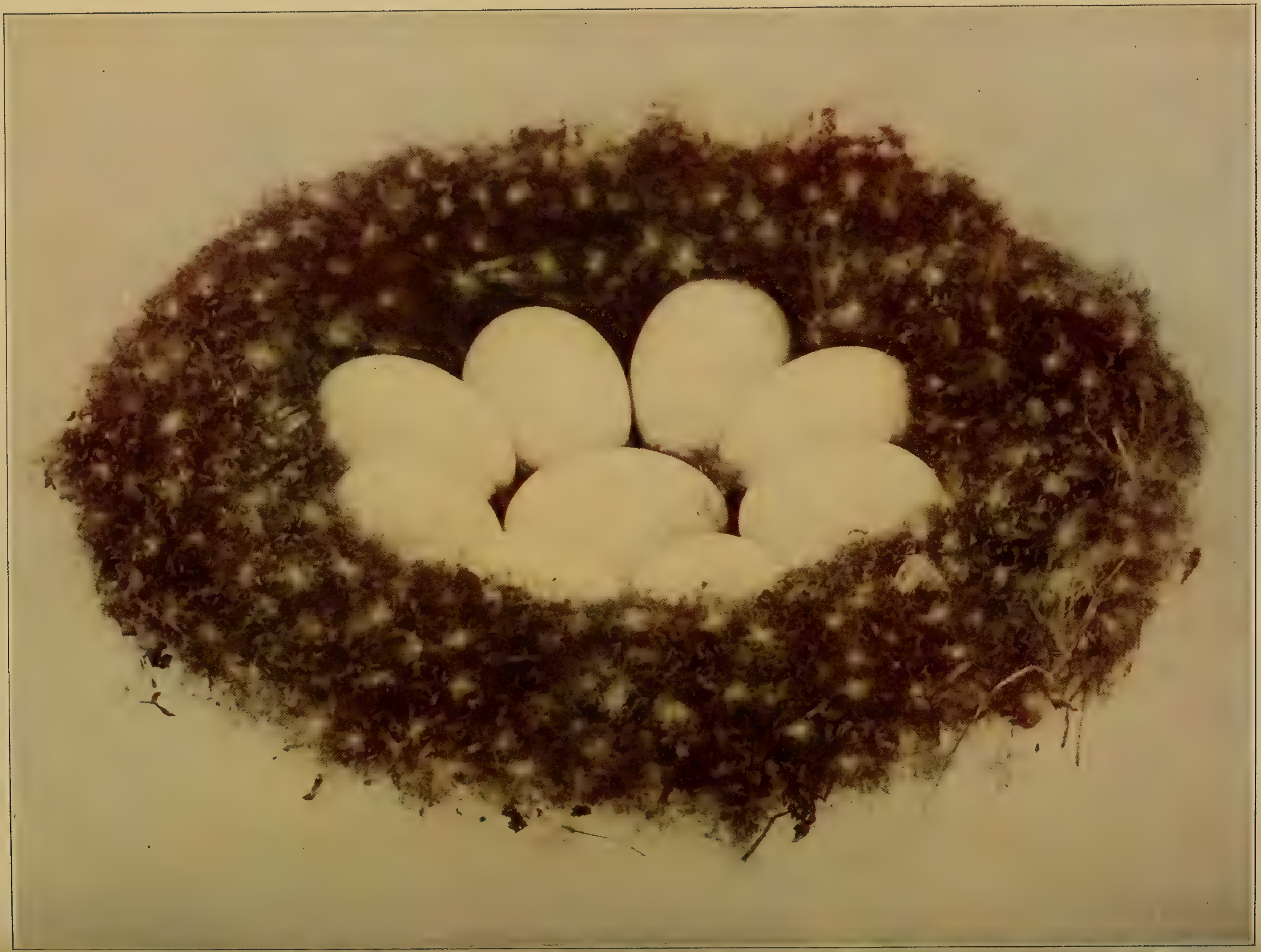
The eggs average two and five-hundredths inches long by one and fifty-hundredths inches wide and range from seven to twelve in number. Their color is creamy buff, elliptical in shape and with a moderately polished surface. Gadwall's eggs have a richer, warmer hue than those of the baldpate with which they are often confused, but those of the latter are a paler buff, approaching white.

In certain localities where the Gadwall is known to breed, they show a decided preference for islands in small lakes, or a slight elevation in a bayou or lagoon. In such situations several nests of the Gadwall may be found within a radius of a few rods and frequently the baldpates take up their abodes in close proximity to their near relatives.

Among the many wet depressions, potholes and ponds of North Dakota, few, if any, appear complete without the characteristic muskrat houses. I have passed such places on the hottest days of June and have seen the rat house literally covered with ducks, mostly drakes, and among them were a goodly number of Gadwalls, all dozing in the sunshine and expressing no fear whatever at my intrusion.

The nest and nine eggs shown in the illustration were taken on the fifteenth of June, 1900, near Graham's Island, Devils Lake, North Dakota. The eggs rested in a slight hollow in the earth, which was snugly lined with down and sheltered by the weeds and grass which covered the island upon which the nest was located.

Gerard Alan Abbott.



FROM COL. OF GERARD A. ABBOTT.

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THE NORTHERN DIVER.

Wild Diver of the Northern Seas,
You're welcome to our Firth;
Here may you plunge and play at ease;
Here fish and find no dearth.

Though toward the East the light cloud scuds,
The frost has lent an edge
Even to the West, and seal'd the buds
On tree and bush and hedge.

And yet on this, our shortest day,
The Spring-time lies so near,
A sweet surmise of coming May
Speaks both to eye and ear.

Like scatter'd sparks upon the whins
The yellow blossoms stand;
The lark with lisping note begins
To hint that Spring's at hand.

And though the Firth shows chill and grim,
So warm a heart you hold,
That you can plunge in it and swim,
And never feel the cold.

Brave bird! and when our hopes come true
And Spring, indeed, comes back,
My blessing so along with you
Upon your northward track.

The whins are good, the lark is good,
But you are better yet—
The very soul of hardihood,
In flesh and feathers set!

—Henry Johnstone.

A WALK TO THE LIME-SINKS.

The outing had been planned in sunshiny weather, when the dust was lying an inch deep along the highway. But the August sky, without caring for the pleasure of the occasion, had piled up her rain clouds into huge masses, and down came the rain, although the weather flag stood to the breeze white—for fair weather.

It rained in a soft drizzle, and the anticipation of a delightful trip to the Lime-sinks was blighted. The prospect of going, even, seemed foolish to those who cared for their clothes or feared the effects of getting wet, but some who cared not for any discomforts clamored to go when the rain ceased, although the clouds still looked soft and unsettled.

With umbrellas to ward off the rays of the sun which shone hot upon the wet earth, the party set forth to visit the four Lime-sinks or caves, as many of them may be called, which are nearest Sandersville.

Heavy clouds, black with the remnant and recoil of tempest, lay banked together in the east; across these a beautiful rainbow spanned the horizon from north to south, showing its glorious colors against the dark gray sky. Red, orange, yellow, green, blue, indigo and violet—all the colors of beauty and sublimity into which the refraction of light may be divided.

The way was short and the party full of gayety and life's sunshine. Many a gay jest and laughing repartee were flung back and forth as the distance was traversed.

Nature opens her storehouse of charms to the pedestrian alone. She must be wooed by close contact in secret recesses, and then she gives of her best to those who seek her rightly. For him her beauties are revealed at every step and the nectar chalice awaits his eager grasp. The dawn inspires him with renewed vigor, and the dusk leaves him still unsatisfied, conscious that returning dawn will bring sweeter joys. His blood is quickened into healthful pulses, it is "aerated by the air that sings through the pine woods and tingles in every fiber. Tingling blood makes life joyous, and joy can hardly look without a smile or speak without a laugh."

Across the brawling Limebranch a stout foot-log was laid and those who loved to watch the rivulets as they speed on their way went down to the water's edge to enjoy the rush and plunge of the stream heightened by the late acquisition of raindrops. The background of gray clouds was brightened by the remnant of the rosy afterglow of the bow, so lately shining forth in all its loveliness. The sloping hills were green with summer brush and brier. The location of the stream could be followed by the trees that sentineled and hid away the shouting water. There were maples, pines, oaks, chincapins awaiting the kiss of September's sun to open their green burrs, sweetgums already turning red, and the white birches dusting the banks with gold.

On either side of the Limebranch the land has been cleared, and what had once been a large woods -was now only weed grown hills, with cotton in the valleys.

Those who came to obtain specimens began to chip the fossils from a deposit of lime near the stream. These lime-biscuits are found in ovens, or beds, and arranged as symmetrically as though some housewife had left her pan of biscuits for after generations to puzzle over. They are smooth on the upper side, slightly convex, with a figure in the center which resembles the starfish; they are round and always rough on the under side.

Across the foot-log, the way led through a cotton-patch. Adown one row ran the path of soft, white sand, moist and crunching under foot, giving out a fresh smell of new earth when trod upon.

To the right, a tall, dead tree—killed to make one more row in which to plant King Cotton—stood draped with long festoons of gray Spanish moss. This parasitic growth beautified the naked limbs stretching towards the sky. It was a monarch of the forest, grand still, in its last days of waving gray moss in place of its robe of green leaves, among which the mockingbird trilled its merry song in the happy days of long ago.

The path led down through a little glen moist and dripping with the raindrops from overhanging trees. The damp weeds gave out a strange smell of rank growth and rapid decay. A great bush of hardy green stems thrust out for admiration bunches of bright yellow flowers, stiff and prim, but giving a touch of gayety to the study in green which abounded on all sides.

The first Lime-sink was reached just here, up a little sloping hill straight ahead, and again the brawling stream came into view at a greater depth than when we crossed it. Here it disappeared into a large archway at least seven feet high.

These caves are of natural formation, caused by the slow process of the water wearing away the soft limestone. Their subterranean passages are so low that very few have traversed this one for any great distance, though one man claimed that he went into it far enough to hear the rumble of wheels over his head. At that time the nearest highway was quite a distance and woodland all around; now he would not have far to go, as a road has been made to reach the plowed land lying on either side of the Limebranch.

Beyond, the stream glides from underneath a natural bridge, wide enough for a wagon to cross over upon it.

On the opposite side of the bridge the stream appears in a deep ravine, twenty feet or more. Here it is a turbulent body of water, with numberless cataracts where the water rushes and plunges, whitened into foam by its struggles with impeding forces. Still it does not weary, as the sounding waters harmonize with the melodies of nature coming from every side.

A wild, bush-grown path led to another lime oven on the edge of the cliff, but the late rain had made this place unsafe and the fossil seekers did not venture, though the view of the water is beautiful from the ledge.

Back down the little slope, we reach a grass grown path where the stream once more winds into view and again disappears into one of the peculiar caves. This cave is of easy access as the stream is near the surface. The archway is scarcely three feet high, but quite dry inside as the stream goes some distance underground before entering the cave or tunnel, and where it does enter, the passage way is high enough for a person to walk upright. The unimportant fact that one had to enter the cave on all fours, owing to the smallness of the entrance, did not dampen the ardor of those who wished to explore its mysterious windings. However, as scrambling into the narrow entrance was found to end in disaster in the matter of clothes, only a few made the trip.

A few yards further down the path the stream appears, deep in the ground again, and from the arched opening the fumes of sulphur and smoke floated out upon the pure, fresh air. The exploring party had struck a match to light a lantern when the twilight of the tunnel succumbed to stygian darkness.

At this point the threatening clouds caused a halt in our onward progress. The weather-wise ones advised going home, but those who did not mind a wetting were opposed to going, but gave in about visiting the site of the old dam, where once upon a time this noisy little stream had been used to turn a mill-wheel. So we retraced our steps and went to the cave on the other side of the foot-log.

The path went round the curve in the road now, and led through a bosky dell of wet grass and tall weeds until a little bridge over a dry gully brought a halt to further going.

"This leads to the cave," said Ben. "But wait until I call you." Jumping off of the bridge he disappeared through the bushes, followed by the other boys of the party.

Everything was so wet that it was pleasanter to wait until some pioneer hewed the way.

"Where is the cave?" asked the last comers.

"The boys have gone to locate it, as it has lost itself," was the answer. "Have you found it?" we called to the boys.

"We are making it now," they replied. And from the sound of cutting, one could well believe that true.

"Come on, follow our voices," they finally called.

And through the wet grass and tangled weeds and dripping bushes the party went, laughing in merry humor, happy in being so close to Mother Nature even if her welcome was extended with wet arms. It was a day of glory, though every leaf held a water-drop, and it was enchanting to make a part of it.

The hill began to slope downward, the bushes grew higher and closer together; just here a rabbit, frightened by the noisy crowd, scampered through the grass.

Parting the bushes we could see a deep ravine with precipitous sides, covered with wet dead leaves, making it necessary to hold on to the undergrowth for support. The cave was out of sight unless one went down a steep way from which the boys had cut the bushes. Great bosks of ferns grew on either side of the bank, and everyone filled their hands full of the feathery green fronds. Down upon the very edge of the ravine one could lean over and see the tall, narrow opening of this cave into which the stream disappeared.

Only three girls were brave enough to venture down to the stream, but they claimed to be fully repaid for the trouble. Steps had to be cut in the soft limestone on the opposite bank for them to ascend out of the chasm into which they had descended. They returned to us wet and muddy from their scramble up the face of the cliff.

In one basin of the hills, the surrounding country is entirely hidden from view, only the hilltops reaching up to the horizon, and the clouds coming down to meet them on every side form a little shut in place of nature's loveliness, filled with sweet smelling plants, reedy grasses brightened by the blooming wild flowers and a young growth of pines and sweet-gum trees.

But over the skyline the path led through thickets of sumach brilliant with the crimson of its freshly ripened fruit, wound through fields of cotton whose limbs bend with the white fleecy staple, skirted upland pastures royal with the purple of the wild pea blooms. Here it ran down a sloping hillside into the favorite resort of picnicers. The stream runs through a flat bottomland and spreads out over the shining sands beneath the outspreading branches of the trees, lazily resting after some rush of force or leap of a cascade, hoarding its waters for the merry time to come when a downward course will demand more impetus than now.

Here is also the Boiling Spring, a basin of pure water at a bend of the stream and containing five miniature artesian wells or boiling springs. Water is one of our common blessings, yet a drop of water has riddles which our profoundest science cannot solve. It was pleasure to drink water so sweet and pure that Anacreon would have deserted his cup for its purer inspiration.

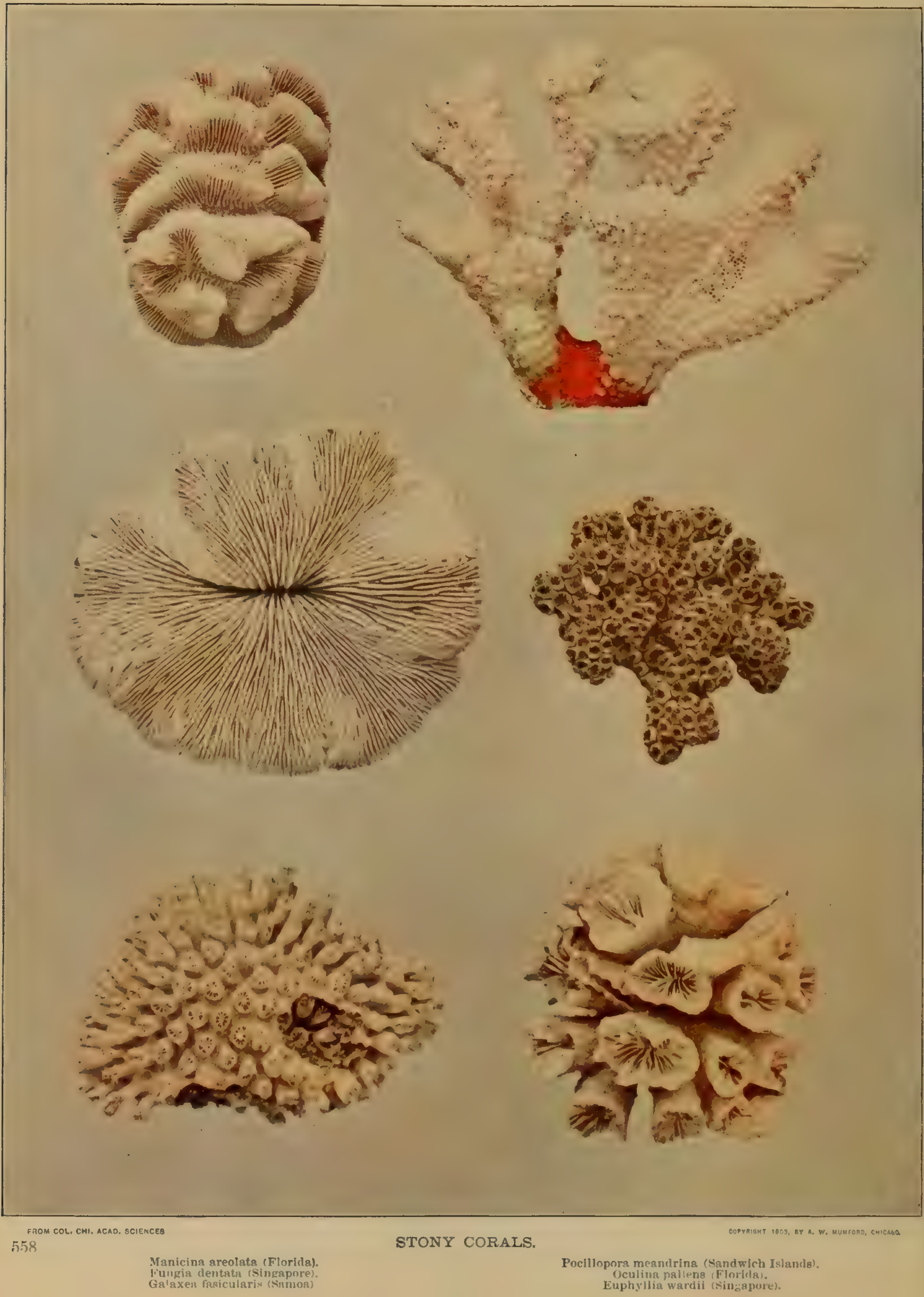
The banks of the stream were so wet and slippery that it was out of the question to hunt for fossil teeth, ribs, and shells of endless variety which may be gathered in almost any quantity. The friends of science have reason to regret that Sir Charles Lyell, the eminent English geologist, who passed when in Georgia within three miles of Sandersville, did not visit this old geologic burying-ground. Little is known of these "Medals of Creation," and it is hard to decipher the strange inscriptions on their tombs, or "the interpretation thereof."

And the springs kept bubbling up—up. It was fascinating to watch them, never pausing, eternally moving; soft, yielding, yet never over-and-done with movement of nature's exquisite workmanship. We were never tired of looking. The chance would not come to decide that the curiosity was satisfied, so we might turn and go away.

We must go home, at last suggested one of the party, and thus admonished, with a desire to still linger, we went up once more to the uplands.

The August birds, though silent, flitted among the branches of the trees in this woodland retreat—bluejays, mocking-birds, swallows, sparrows and numerous others of the feathered tribe. There is much to see along this Limebranch, but outside the faunal world, outside the farm hands going afield to their labor, one seldom meets there a traveler. Persons have resided near the spot for years, and yet have not had the curiosity to visit these Lime-sinks.

Mary Susan Harris.



FROM COL. CHI. ACAD. SCIENCES

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STONY CORALS.

Manicina areolata (Florida).
Fungia dentata (Singapore).
Galaxea fasicularis (Samoa)

Pocillopora meandrina (Sandwich Islands).
Oculina pallens (Florida).
Euphyllia wardii (Singapore).

THE STONY CORALS.

The Stony Corals are of almost endless variety in form and character and more than 2,000 species have been described. Some of these species live solitary lives while others form huge colonies which build whole islands by the accumulation of their stony supports. Some are very large while others are of small size.

Anyone who visits the seashore may easily become acquainted with a first cousin of the Coral polyp, the sea anemone, which is really a Coral animal without a stony support. These animals are placed in the order Zoantharia of the class Anthozoa. The name of the order is from two Greek words and signifies flower animal and the student who gives these beautiful creatures the study which they deserve cannot fail to be impressed by their close resemblance to flowers, not only in their form but also in their varied colors, which rival those in any of the blossoms of mother earth. The sight of a vast field of sea anemones with their brilliant colors, graceful bodies and waving tentacles is one not easily forgotten.

The sea anemone being the type of this class of animals a description of it may not be out of place. The body is sac like, or cylindrical, the base is somewhat spread out and is attached to a stone or other foreign object. The disk or upper end supports a row of tentacles of which there may be as many as two hundred, arranged in multiples of five or six. The internal organs consist principally of the stomach which is placed in the center of the body near the base. The body cavity it divided by partitions or mesentersis, which form a series of compartments. It is to these partitions that the reproductive organs are attached. The Coral polyps are essentially the same in structure as the sea anemones, with the addition of the ability to form a stony base or support composed of carbonate of lime. The mesenteries of the polyp are reproduced in the stony base and are known as septa. In those Coral polyps which live solitary lives, as the fungus corals, the body is similar to that of the sea anemone, but in those species which form a colony, each polyp seems to project or bud out from a mass of animal matter which covers the stony support. Some of the sea anemones are capable of very slight locomotion, but the Coral polyp is a fixed animal, after leaving the larval condition.

Although apparently very sensitive, the animals of this class are destitute of a distinct nervous system, the nervous tissue being confined to a few nerve cells at the base of the tentacles. The contraction of the tentacles and disk is due to two sets of powerful muscles, one vertical and one horizontal, which pull the mass together. Each tentacle is also retracted by two sets of muscles. The tentacles are hollow and the process of expanding them is simply that of filling them with the fluid in the body chambers while their contraction is a reversal of this process. It has been found that some sea anemones possess a slight sense of smell.

One of the most remarkable and interesting characteristics of the sea anemones and Coral polyps is their power of throwing out nettling or stinging organs which paralyze their prey. These organs are in the form of long, coiled filaments placed on the edge of mesenterial partitions and situated between those mesenteries forming the walls of the body chambers. Unlike the partitions, they reach only a part of the way across the chamber, and are especially designed to support these stinging organs. These nettling organs or barbs are ejected through the mouth, tentacles and small openings in the sides of the animal. They consist of a long coiled filament ending in a peculiar barb-like projection, and from their fancied resemblance to a lasso they have been termed lasso cells.

Although these nettling organs are

deadly to most of the marine animals, there is one notable exception. On an island between New Guinea and Australia there lives a species of sea anemone which attains a diameter of two feet, and in its interior stomach cavity there lives a little fish (Amphiprion), which enters and leaves this strange abode without suffering harm from its host. This is an example of commensalism, the fish and anemone being mutually beneficial to each other.

There are many animals, however, which suffer the penalty of being eaten when they approach too near the apparently harmless polyp, for they are immediately paralyzed by the stinging organs and drawn into the capacious mouth of the polyp by the tentacles. Small fish, strong crabs with their formidable pincers and mollusks alike fall victims, their strength being of no avail against the benumbing influence of these little barbs. It is recorded that a bee once mistook a sea anemone for a flower as it lay expanded just beneath the surface of the water, and it found its mistake too late, when the anemone paralyzed it and after a few struggles drew it into its stomach.

The sea anemone possesses a wonderful power of reproducing parts of its body which may become cut off or injured in some manner. If a polyp be cut in several pieces each piece will eventually become a perfect animal.

Coral polyps reproduce their kind in three ways; first, in the ordinary manner by means of eggs. Some species of the polyps are separated into sexes, male and female, but there are a large number which are hermaphroditic, having the male and female organs in the same body. A second method of reproduction is by gemmation or budding and in this case a new individual simply grows from the base or some other part, of an older individual. A large number of the colonial polyps increase in this manner. A third manner, called fission, is by self division, in which the animal breaks in two, forming two individuals. The polyps which develop from eggs are at first oval, ciliated embryos which swim about in the ocean for a time and finally settle to the bottom in a favorable spot, where they become attached to some object, and begin to build their limestone support. The family Astraeidæ or star Corals are closely allied to the sea anemone, many of the species differing principally in the presence of the limestone support. These Corals are very beautiful, forming rounded hemispherical domes or long, tortuous trenches. The common brain Coral of Florida and the West Indies (Meandrina cerebriformis) grows to an immense size, specimens having been seen on the Coral reefs which measured over ten feet in circumference. The little folds which cover this Coral resemble the convolutions of the human brain, hence the common name cerebriformis, "formed like a brain." Another common, though very much smaller species is the Manacina areolata, which is to be found abundantly on the Florida Keys.

The fungus or mushroom Corals, belonging to the family Fungiidæ, are among the most remarkable of all the Corals. They frequently form circular or elliptical discs, conical caps or long, narrow inverted troughs. These are all made up of sharp, erect lamellæ which radiate from a common center to the periphery of the disc. They attain a considerable size, some specimens being a foot in diameter, while the trough-shaped individuals attain a length of nearly twenty inches, the width of which may not be over five inches. The attached forms grow in simple leaf-like expansions, sometimes at the side of other Corals, like a lichen on a tree stump. Others form hemispherical clusters which resemble leaves, vases or massive columns.

The colonies of the Caryophyllidæ form bushy clumps, convex masses, leaf-like clusters and goblet-shaped designs, and frequently attain a height of six feet. Several species are common in Florida and the West Indies, among which may be mentioned the milk white Coral (Galaxea) which builds rather long, cylindrical tubes from a wide stony platform, and the Eyed Coral (Oculina) which forms beautiful vase-like cups on graceful branches.

The family Favositidæ is of great interest on account of its great antiquity, it having commenced life in the early Ordovician age of geological time. Though once forming huge Coral reefs, this family is now content to produce comparatively delicate ramose shapes like the Pocillopora meandrina of our illustration.

Of all the Corals none excel the Madreporas or pore Corals in size, beauty or abundance. They are the predominating species of many Coral reefs. There are over seventy species known, the larger number being confined to the Pacific Ocean, where they flourish in countless multitudes. The polyp of this Coral is a simple, star-shaped animal of twelve rays, and the colors are mainly bright green, red or umber. The Madrepora Coral may usually be known by its peculiar branching shape. Frequently it will form a broad, flat expansion many feet in extent, from which numerous little tree-like branches extend vertically, forming a miniature Coral forest. Other shapes occur, such as shrubby, reticulated, foliated and vase-like.

The limits of this article precludes the possibility of enumerating more than a very few of the many forms of Stony Corals. They are found in all the warm waters of the globe, and several species, as the little Astrangia danæ of the New England coast, brave even the inhospitable shores of the temperate clime. Of the Corals reefs and their formation we shall speak in another article.

Little is known concerning the rate of growth of Corals. A specimen of brain Coral, taken from Fort Jefferson, in the Tortugas, which had been in the water for over twenty years, was a foot in diameter and four inches in thickness. A gentleman residing at Key West, Florida, calculated that the brain Coral grew at the rate of half an inch a year. Prof. Verrill, of Yale College, the well-known specialist of this branch of zoology, states that a Madrepora found growing on the wreck of the ship Severn grew sixteen feet in sixty-four years, or three inches each year. From these facts, it will be seen that Corals grow rather slowly and we can dimly imagine the tremendous length of time which must have been required to build up the extensive reefs in the Indian Ocean or the gigantic barrier reef on the northeast coast of Australia.

FRANK COLLINS BAKER.

VOX VERNA.

The midnight sky is clouded thickly o'er;
  The East wind, moist and cold,
  Blows over sodden wold.
Night's silence reigns by inland river's shore,
  Save that from darkened sky
  I hear the wild drake's cry,
Calling the flock to Northern clime once more.

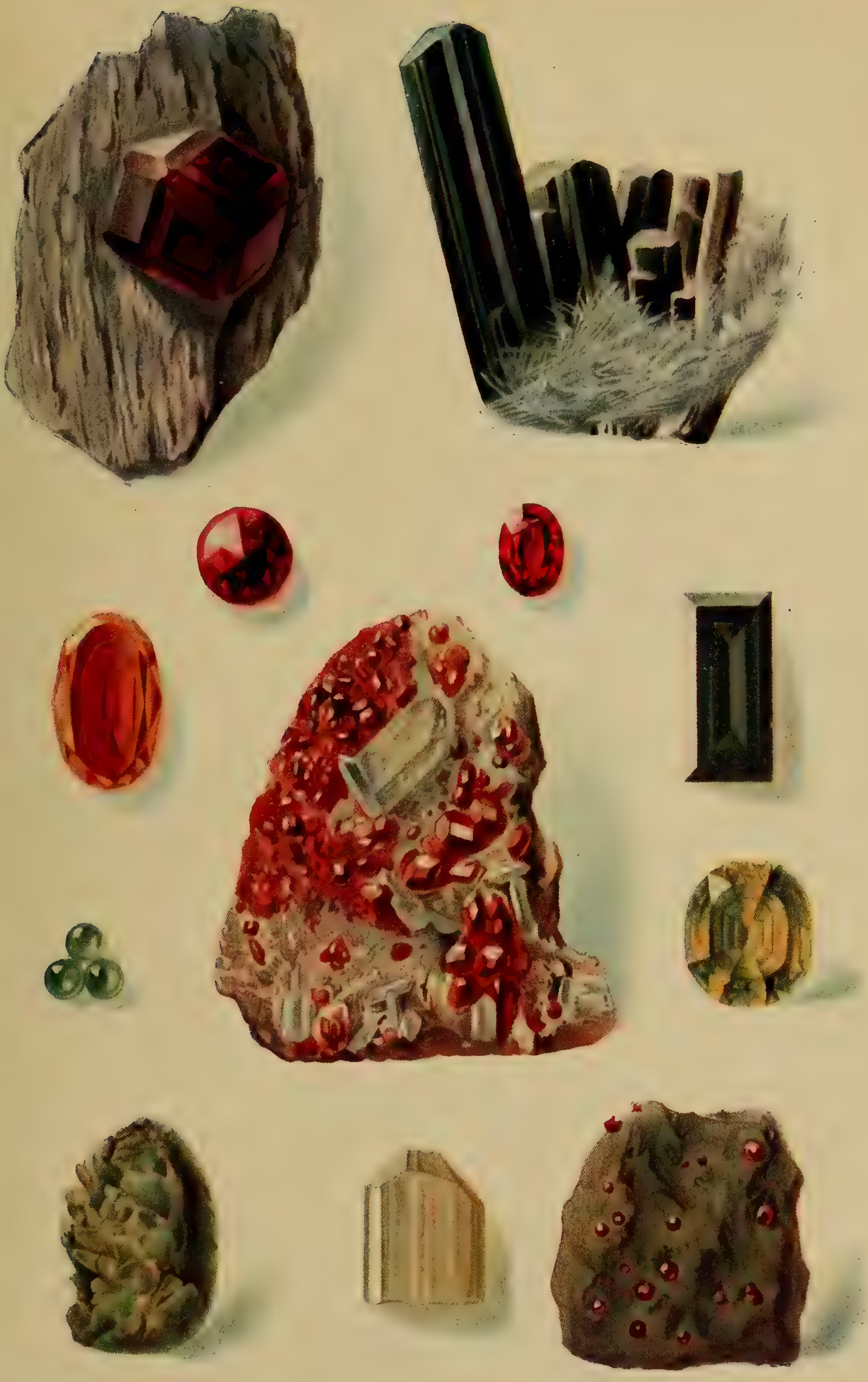
—EDGAR MACLAREN SWAN.

CHRYSOLITE.

This mineral is known among the gems by many names. It is often called chrysoberyl by jewelers, while the true chrysoberyl is called Chrysolite. It is also known by different names according to its color, it being called peridot when of a deep olive-green, olivine when of a yellowish-green and Chrysolite when of a lighter or golden-yellow color. The name Chrysolite means gold stone. Again some so-called emeralds are really Chrysolite, a notable case being those shown in connection with the Three Magi in the Cathedral at Cologne. The so-called "oriental Chrysolite" is yellowish-green sapphire, "Ceylonese Chrysolite" is olive green tourmaline, "Saxon Chrysolite" is greenish-yellow topaz, "false Chrysolite" is moldavite, "Cape Chrysolite" is prehnite, and so on. The various designations have evidently arisen by confounding different minerals similar in color but it is an easy matter in any case to distinguish the minerals by a test of their physical and chemical properties. One feature distinguishing Chrysolite from most other gems is its relatively low hardness, which is 6¾. It will thus scratch feldspar, but is scratched by quartz and most other gems. Again it is relatively heavy, its specific gravity being between 3.3 and 3.4. Its luster, too, while vitreous, has a slightly oily tinge, which can be detected by a little experience. Chrysolite is easily dissolved by the common acids, especially if powdered and warmed, the silica separating in a gelatinous form, which is quite characteristic. In composition it is a silicate of magnesium and iron, the relative percentages of the two latter elements varying. In gem Chrysolite the percentage of iron is usually low and a typical composition would be: Silica, 41 per cent; magnesia, 49.2 per cent, and iron protoxide, 9.8 per cent. Before the blowpipe Chrysolite whitens but is generally infusible. It crystallizes in the orthorhombic system and is hence doubly refracting. The crystals have good cleavage in one direction and partial cleavage in another. The fracture is conchoidal. Chrysolite is a common constituent of eruptive rocks, but in grains too small and too opaque to be used for gems.

Whence the large, transparent pieces of Chrysolite used for gems are obtained does not seem to be known. They are reported to come from the Levant, from Burmah, from Ceylon, from Egypt and from Brazil, but the exact locality in none of these countries has yet been ascertained by writers. Mr. George F. Kunz says that all the Chrysolite sold in modern times is taken out of old jewelry, often two centuries old, so that it is likely that the old localities are either forgotten or exhausted. Recently, however, quite an amount of good Chrysolite has come from a locality in Upper Egypt near the Red Sea, and this is doubtless one of the old sources of supply. The Chrysolites at present available are not of very large size, rarely exceeding an inch in diameter. They are, however, of fine color and transparency and make a desirable gem when not exposed to hard usage. For ring stones they scratch and wear away too easily. Excellent small Chrysolites come from Arizona and New Mexico, being found in the sands in connection with the pyrope garnets previously mentioned in those localities. There they are locally called "Job's tears" on account of their pitted appearance. Chrysolite is an essential constituent of meteorites and the grains sometimes occur in these bodies of sufficient size and transparency to be cut into gems of about a carat each. Such stones have a peculiar interest on account of their origin.

Chrysolite is frequently mentioned in the Bible and in ancient literature, but it is pretty certain that much of the



FROM BAUER'S EDELSTEINKUNDE.

Alimandine Garnet (Alaska). Epidote (Knappenwand, Austria).

Almandite Garnet, cut. "Cape Ruby." cut.

Essonite Garnet, cut. Epidote, cut.
Demantoid Garnet, cut. Essonite Garnet and Diopside (Italy). Chrysolite, cut.
Demantoid Garnet (Ural Mts.). Chrysolite crystal. Pyrope Garnet (Bohemia).

Chrysolite so named was our topaz. If this is true the Chrysolite of the ancients was found on the island of Topazios in the Red Sea. Diodones Siculus says of the stone there that it was not discernible by day but was bright at night, so that it could be seen by patrols. They would cover the luminous spot with a vase and the next day come and cut out the rock at the place indicated, when upon polishing, the gem would appear. The name Chrysolite was also applied to a number of other yellow gems such as zircon and beryl, in former times, as stones of a similar color were usually classed together.

Oliver Cummings Farrington.

EPIDOTE.

This is a mineral possessing several interesting characters and having many qualities desired in gems, yet its use in jewelry is very limited. It is comparatively common as one of the constituent minerals of metamorphic rocks, but in its ordinary occurrences it is not suitable for gem purposes. It is only when occurring in large transparent crystals that pieces suitable for cutting can be obtained. Its peculiar green color is one of its most striking characters, enabling it nearly always to be recognized. This color is a yellowish-green known as pistachio green and is hardly possessed by another mineral. It frequently, however, shades to black on the one hand and brown on the other so that it cannot be taken alone as a criterion for determination. Epidote is quite strongly pleochroic—that is, it exhibits different colors in different directions, being often green in one direction, brown in another and yellow in another. It is usually cut so as to show the green color, and the stone must generally be made quite thin to get the proper transparency. Epidote is a rather hard and heavy mineral, its hardness being nearly equal to that of quartz and its specific gravity 3.2 to 3.5. It is brittle and has a basal cleavage. Its luster is vitreous to resinous.

In composition it is a hydrous silicate of calcium, aluminum and iron, the darkness of its color increasing with a larger proportion of iron. It is fusible before the blowpipe, but unattacked by acids before fusing. The finest crystals of epidote for cutting come from the Knappenwand in the valley of the Pinzgau, Austrian Tyrol. Specimens of these are shown in the accompanying colored plate. This occurrence was discovered in 1866. Quite recently an occurrence of Epidote more beautifully crystallized even than that of the Knappenwand was discovered on Prince of Wales Island, Alaska, but unfortunately these specimens are too opaque for cutting. Being a rather heavy mineral, Epidote lingers among the pebbles of stream beds, and material suitable for cutting is hence sometimes found in this way. Brazil and North Carolina are localities where Epidote of this sort has been found.

Oliver Cummings Farrington.

CHRYSOBERYL.

This mineral is like beryl in containing the element beryllium, but in other respects it is a distinct species. Chrysoberyl has no silica in its composition, as has beryl, but is composed of glucina, beryllium oxide and alumina, the theoretical percentages being glucina 19.8, alumina 80.2. In nature, however, some other oxides are usually present as impurities or replacing the alumina. Such are iron and chromium oxides. Chrysoberyl is remarkable for its hardness, this being 8.5, and thus near that of corundum. The cut stones therefore retain a polish well. The specific gravity of the mineral is somewhat greater than that of the diamond, being 3.5 to 3.8. It crystallizes in the orthorhombic system and often forms twins which are so united as to make a six-rayed stellate crystal or six-sided prisms. An illustration of one of these crystals may be seen in the colored plate of Birds and Nature for January. Chrysoberyl has a prismatic cleavage and conchoidal fracture. Its luster is vitreous, tending to oily, and is brilliant. The mineral is infusible and is not attacked by acids. In color Chrysoberyl usually presents some shade of green, tending at times to brown or yellow. The name Chrysoberyl means literally golden beryl and suggests a yellow stone. While this is a common color, grass-green and emerald-green are frequent and characteristic in occurrence. Among jewelers Chrysoberyl, especially the Brazilian Chrysoberyl, is often known as chrysolite, a custom which has doubtless arisen through the similarity in color of the two minerals. Three kinds of Chrysoberyl are employed in jewelry and being given different names may be considered separately. These are, (1) ordinary Chrysoberyl, (2) cymophane, or cat's-eye, and (3) alexandrite. Ordinary Chrysoberyl, also called Oriental chrysolite or chrysolite, is greenish-yellow to smoky brown in color and is employed as a gem only when transparent. It is for the most part obtained in Brazil and Ceylon, occurring in the gem gravels of both these countries. The Brazilian Chrysoberyls are rolled pebbles, scarcely larger than beans and occur together with topaz, garnet, tourmaline, quartz, etc., in the beds of streams chiefly in the northern part of the province of Minas Geraes. The stones occur in the neighborhood of granite and gneiss and were therefore probably originally formed in these rocks. The Ceylonese Chrysoberyls are likewise found in stream beds and come from Saffragam and the neighborhood of Matura in the southern part of the island. In North America, Chrysoberyl has been found in Maine, Connecticut and North Carolina, but few stones sufficiently transparent for cutting occur. Cymophane, or "cat's-eye," is a name given to a translucent, opalescent variety of Chrysoberyl, across a polished surface of which may be seen to play a single long, narrow ray of light, changing position with every movement of the stone. The phenomenon is like that of the star sapphires, except that but a single ray is seen instead of several. The cause of the appearance is believed to be multitudes of minute tube-like cavities in the stone arranged in parallel position, which reflect the light which falls upon them. In cutting the stone the best effect is produced by giving it the form of a long oval, over the middle of which a light ray runs and produces a resemblance to the eye of a cat. Such stones are the true "cat's-eyes" of jewelry, the quartz cat's-eye being much inferior. The name cymophane, also applied to these stones, comes from two Greek words meaning wavy appearance. The cat's-eye variety of Chrysoberyl occurs together with the transparent kind above described in the alluvial deposits of Ceylon and Brazil. The stones are not large, rarely exceeding 100 carats in weight.

The largest and finest known is in the South Kensington museum of England and is about an inch and a half in length and of the same thickness.

In Oriental countries the cat's-eye has long been highly esteemed a preserver of good fortune, the belief being that each stone is inhabited by a good spirit. It is believed to be a guardian of its owner's wealth and to protect him from poverty. The stone is often carved by Orientals into the form of some animal's head, thus increasing its weird and mysterious aspect. The popularity of the stone among Europeans was suddenly increased a few years ago when the Duke of Connaught gave one in a betrothal ring to his bride, Princess Margaret of Prussia. Cat's-eye immediately became the fashion among the wealthy classes and the supply proved quite unequal to the demand. The stone is still quite fashionable and not less than one hundred dollars per carat must often be paid to secure a good one.

Alexandrite is a variety of Chrysoberyl found in the Ural mountains and received its name from the fact that it was first found on the birthday of Alexander II., Czar of Russia, in the year 1830. Moreover, the colors which it presents, green and red, are the national colors of Russia. Alexandrite by ordinary light appears dark grass-green or emerald green in color, but on holding it to the sunlight or viewing it by artificial light it appears columbine-red. The gem has therefore the unique property of appearing as "an emerald by day and an amethyst by night." The locality where alexandrite was originally found and where most of it has been obtained is Tokowoia, a place eighty-five versts east of Ekaterinburg. Only the transparent pieces can be used for gems and as these are relatively scarce the price of the gem is high. Of late alexandrite has been found in the gold sands of Sanarka in the southern Urals, but a more important source of supply has appeared in Ceylon, where gems much larger than those in the Urals and in a fine variety of colors have been found.

Oliver Cummings Farrington.

THE NESTS.

Those brown and rounded patches in the maples,
  In the elms, the oaks, the hemlocks and the pines?
Why, those are just the summer dwelling places
  Of the birds who left them there for trav'ling signs.

When skies were blue and leaves were bright and verdant,
  Of the homes the songsters made we saw but few;
But now they bow and nod, and fain remind us
  Of the joys which in the balmy months we knew.

And when the frosty goblins end their revels
  'Mid the limbs that bud and blossom to the Spring,
We'll see tenants homing to their houses—
  There to work and play, rebuild and mate and sing.

—Jac Lowell.

A WOOD RAT BURGLAR.

The Western Wood Rat, not unlike the magpie, is a noted pilferer of small articles. Both the bird and rat will steal things that can be of no possible use to them, apparently for no other reason but to commit mischief. Such purloined articles will be carefully hidden away and the owner is left to vaguely conjecture what has become of his little belongings.

The following story of an Oregon Wood Rat is true in every particular:

In the Willamette Valley, near the Coast Range of mountains, lived a well-to-do rancher, who had a man and his wife employed about the farm, the latter as a domestic.

It was summer, and the weather being very warm, the rancher's wife was in the habit of leaving the windows of the house raised during the nights, for comfort.

Soon the rancher's wife began to miss little articles, spoons, knives and forks, spools, needles, scissors and a great many other useful little things magically vanished. At first the lady was sorely vexed and perplexed over her repeated losses. She consulted her husband and he failed to throw any light on the subject.

Finally the lady suspected the hired man's wife of the petty larcenies, but she forebore making accusations without having positive proof. Long and diligent search was made for these missing articles, but not the slightest trace could ever be discovered. It was most mystifying and provoking. At length some of the lady's jewelry disappeared, including a small gold watch; then her little silken purse containing money. By this time both the rancher and his wife were positive that the hired woman was the thief, but did not openly accuse her, as they could yet prove nothing.

One night the rancher carelessly laid his purse, containing a sum of money, on the bureau. The next morning the purse had vanished and could not be found.

The rancher then accused the woman of all these thefts, and ordered her and her husband to leave the place. They were very angry at the accusation, and both vehemently protested their innocence, but the rancher and his wife would not relent. They even threatened to prosecute the couple.

A few months after the latter went away, the rancher, while hunting one day in the woods, came across a monster nest of a Wood Rat. The nest, built in the forks of a leaning tree, was fully half a mile from the rancher's home.

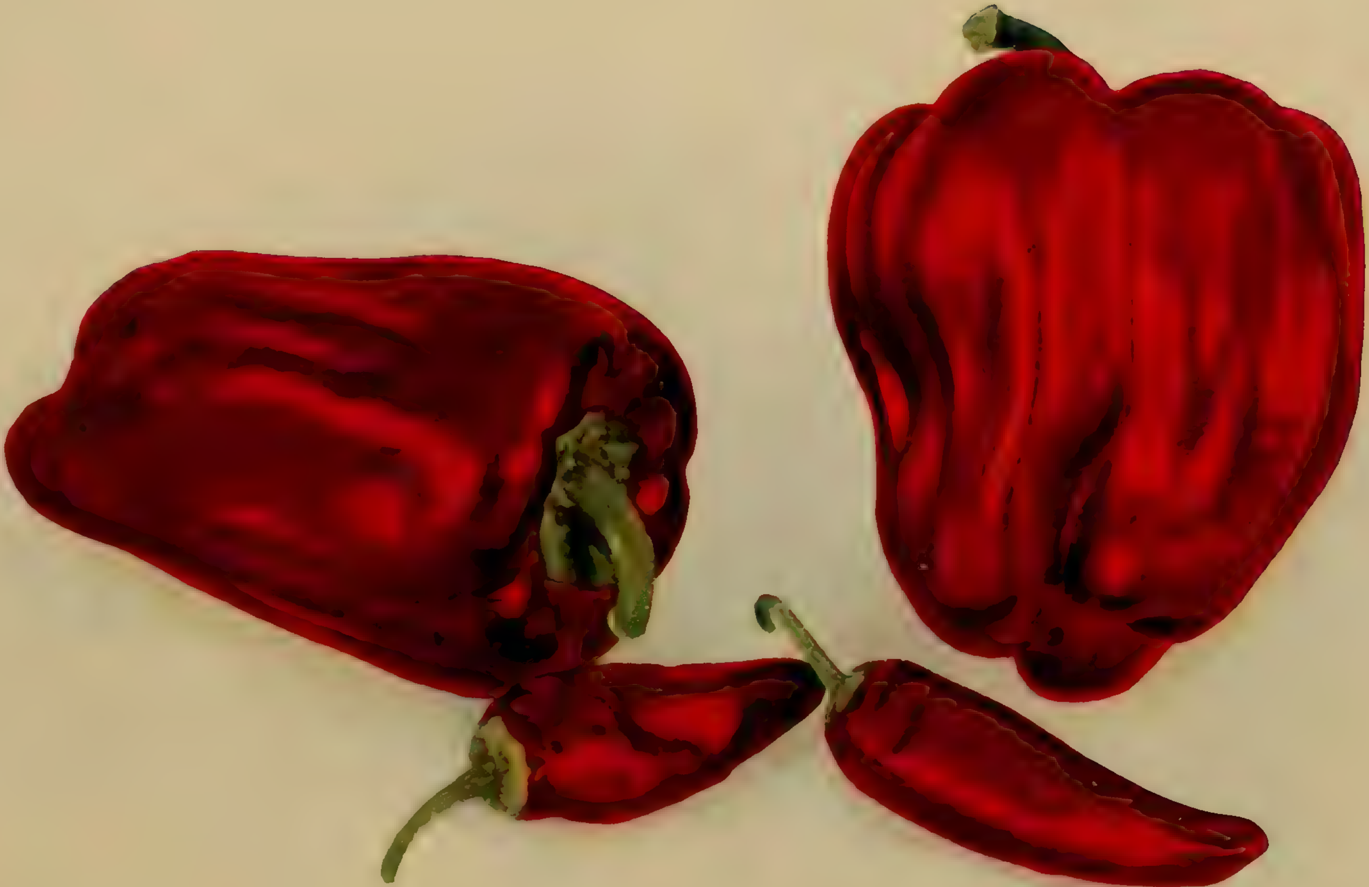
Prompted by curiosity, the rancher chopped the tree down, shot the Rat, which was a very large one, and tore open the nest.

When the Rat's home was examined carefully the mysterious thefts were explained at a glance. In the animal's home was found every article that had disappeared. The gold watch, jewelry, and the two purses, with their precious contents untouched, were all there, just where the thievish creature had stored them carefully away.

How many long trips to and fro the Rat had made was never known. But the animal had shown an industry worthy of a better cause. All his work was done during the night. Hidden by darkness the animal entered through the open windows, prowled around at will and noiselessly assisted himself to any article that gratified his fancy. As none of the articles could be of the least use to the rat, it might well be wondered what possible instinct prompted such gratuitous thieving.

Both the rancher and his wife deeply regretted the injustice done the suspected couple, but it was too late to make reparation after the real thief was discovered. The mischief-loving Rat met a deserved fate.

J. Mayne Baltimore.



RED PEPPER.
(Capsicum annum, Varieties).
About Life-size.

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RED PEPPER.

(*Capsicum annuum, L.*)

> That most delicate, palate-scorching soup called pepper-pot, a kind of devil's broth.
> —T. Brown: Works, II.

Red pepper is a spreading, typically herbaceous plant belonging to the night shade family (Solanaceae). Stems are soft and green in color. Leaves are simple, margin entire, ovate, pointed and stalked. The flowers are not especially showy, white, single, axillary, rarely in twos. The fruit, which is botanically a berry, is green at first, changing to bright red on ripening. It varies in size and form.

The remote history of Red Pepper is somewhat obscure. The plant was presumably known to Theophrastus, yet the fact that Red Pepper did not become generally known in Europe until after the discovery of America has led to the supposition that it is a native of America. If this supposition is correct then of course the plant could not have been known to the ancient Greeks. The Spanish physician Chanca, who accompanied Columbus on his second voyage to America, made record of a spice known as Agi, which the natives added very liberally to their food. In 1514 Fernandez de Ovieto described this same spice under the name Axi, calling attention to the beautiful red fruits which the Spaniards relished very highly as a spice. In 1526 Cortez places Agies among the valuable products of Mexico. The noted botanist Caesalpino (1519-1603) designated Red Pepper as a plant derived from the West Indies. It soon found its way into Spain and was at first cultivated as an ornamental plant but soon began to be cultivated as a spice, not only in Spain but also in other European countries. At the present time Red Pepper is extensively cultivated in most tropical and sub-tropical islands and countries, particularly in South America, West Indies, Mexico, Central America, Southern United States, Spain, Italy and Hungary.

Some of the synonyms for Red Pepper are pod pepper, garden pepper, Spanish pepper, Indian pepper, Turkish pepper, Cayenne pepper, African pepper and paprica. There are in all probability several species though authorities differ. Some give Capsicum annuum and Capsicum longum as distinct species while others (Flückiger) state that they are identical. Two other species are cited. Capsicum frutescens and Capsicum cerasiforme. Some authorities cite one species with numerous natural varieties, others again state that these so-called natural varieties are purely culture varieties. It is highly probable that Capsicum annuum and Capsicum cerasiforme are distinct species. Cultivation, climate and soil produce great variations in the size of the plant but more particularly in the size and form of the fruit. Color of the ripe fruit also varies; from red, the usual color, to yellow and white. According to Koehler, Capsicum fastigiatum of Blume, which corresponds to Capsicum minimum, is a very valuable and distinct species while Fluckiger inclines to the view that it is merely a variety of Capsicum annuum and yields the comparatively small conical red pods known as chillies, also as Cayenne or Guinea pepper. Capsicum baccatum is a species native of Brazil having very pungent fruits.

The fruits are usually collected before they are fully ripened, while they are still of a green color, and dried, whereupon they assume a bright red color characteristic of Red Pepper. They have a very pungent taste and constitute one of the most highly prized and most extensively used spices being added to soups, sauces, meats, salads, mixed pickles, etc. It is a very useful, stimulating tonic, especially indicated in what is known as atonic dyspepsia, or dyspepsia due to a sluggish action of the secreting glands of the stomach. It is consumed in large quantities in Spain, Mexico, South America, Hungary, and Southern Italy. It seems to be the spice especially relished by inhabitants of tropical and subtropical countries. In some countries the food is so highly seasoned with Red Pepper as to render it inedible to those not accustomed to it.

As a spice the powdered dried fruits are used. For pickling the green fruits are preferred. The small pods known as chillies are used principally in preparing a sauce, universally known as chilly sauce. Red pepper is frequently used as an adulterant of vinegar and brandy to produce the desired pungency. It is stated that an excessive use of Red Pepper produces disorders of the stomach which is apparently not true from the experience of those of the tropics who consume it in enormous quantities. Red Pepper has been employed in the treatment of rheumatism, gout, as a gargle in tonsilitis, sore throat, etc. Its principal use at the present time is that of a spice and as a remedy for atonic dyspepsia. Powdered Red Pepper is added to snuff and it is certainly very effective in causing sneezing. Those who work with Red Pepper find it necessary to protect the nostrils against the irritating fine powder.

ALBERT SCHNEIDER.

PREMONITION.

Up in the gray is showing
Gleam like a bluebird's wing;
Over the drear comes blowing
Wind from the hasting Spring.

Eager the straight young birches
Hearken the whispered word,
Down where the sheer bank lurches.
Sap in their roots is stirred.

Tremble the waters under
Roof of their winter sleep,
Crash like a long low thunder
Follows a fissure deep.

Under the snowdrift lying,
Violet, gather your blue;
Feet of the Spring are flying
Up from the South to you.

—MRS. CORA A. MATSON DOLSON.

Vol. XIII. APRIL, 1903 No. 4.

The beautiful is as useful as the useful.—*Victor Hugo.*

Smithsonian Inst.
May 02

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EDITED BY WILLIAM KERR HIGLEY.

ILLUSTRATED BY COLOR PHOTOGRAPHY.

Smithsonian Institution
APR 7 1903
National Museum

$1.50 a Year. 15 Cts. a Copy.
A. W. MUMFORD, Publisher
378 Wabash Ave., Chicago, Ill.

BIRDS AND NATURE

MONTHLY, EXCEPT JULY AND AUGUST.

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BIRDS AND NATURE.

ILLUSTRATED BY COLOR PHOTOGRAPHY.

VOL. XIII. APRIL, 1903. No. 4

THE SINGING WINDS.

The singing winds have gathered fast.
  Among the trees their harps are set,
The ghost of Winter's care has passed.

With sun and shadow overcast,
  The grass with melting snow is wet,
The singing winds have gathered fast.

Black by the marsh the reeds are massed,
  The green frog sounds his castanet;
The ghost of Winter's care has passed.

Far in the skyey spaces vast
  From Northern climes in concert met,
The singing winds have gathered fast.

And vaguely, with the coming blast,
  Drifts a faint scent of violet;
The ghost of Winter's care has passed.

And with this prescience at the last
  December's dearth we may forget;
The singing winds have gathered fast,
The ghost of Winter's care has passed.
        —ERNEST M'GAFFEY, in "The Chicago American."

THE BEWICK'S WREN.

(*Thryothorus bewickii.*)

At length the daybreak in the east,
My heart from fear in part released.
The small fly-catcher first awakes,
The second part the robin takes;
And then the wren and vireo
Begin with song to overflow.

—THOMAS HILL, "Sunrise."

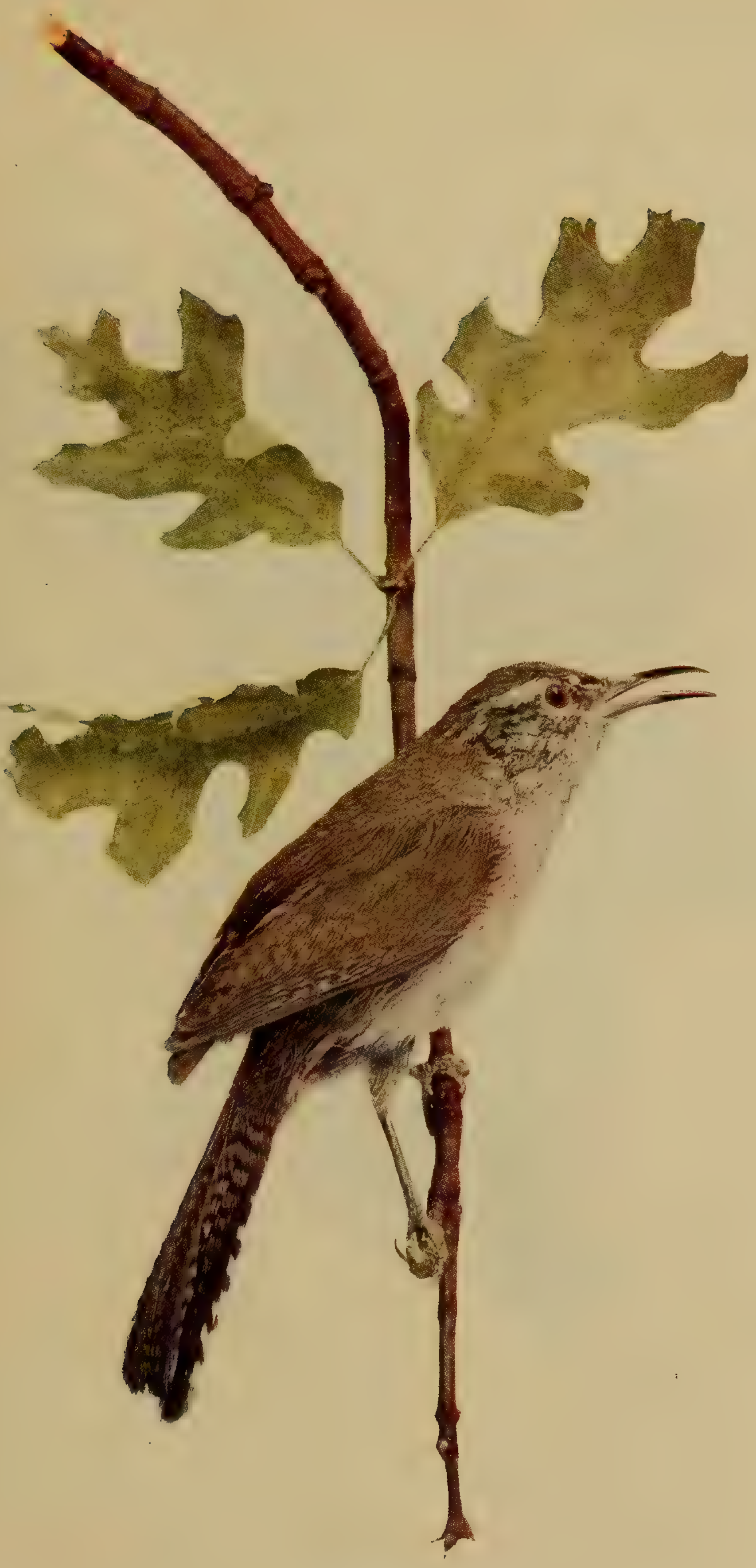
Though the range of Bewick's Wren is quite extensive, its distribution is somewhat erratic. In many districts within its range it is rare or entirely unknown, though the localities may seem to be perfectly adapted to its habits. It is a native of the eastern United States, from the Alleghanies westward to the plains and eastern Texas. On the Atlantic coast it is rare north of Maryland, while in the interior it is common in most localities. Though a somewhat southern species, it nests and is quite abundant as far northward in the Mississippi valley as the state of Minnesota. It is a resident throughout the year except in the more northern portion of its range.

In many localities it is not only abundant, but entirely replaces the house wren. In fact, it is often called the House Wren, or the Long-tailed House Wren. Where both birds are found Bewick's Wren is more truthfully the house species, for it nests in available places about houses, barns and sheds, while the house wrens will often choose the hollow trees of orchards. It has the excitable nature of the other wrens and like them seems full of energy.

Mr. Robert Ridgway has said of this interesting Wren: "No bird more deserves the protection of man than Bewick's Wren. He does not need man's encouragement, for he comes of his own accord and installs himself as a member of the community whenever it suits his taste. He is found about the cow-shed and barn, along with the pewee and barn swallow; he investigates the pig-sty, then explores the garden fence and finally mounts to the roof and pours forth one of the sweetest songs that ever was heard. Not a voluble gabble, like the house wren's merry roundelay, but a fine, clear, bold song, uttered as the singer sits with head thrown back and long tail pendent—a song which may be heard a quarter of a mile or more, and in comparison with which the faint chant of the song sparrow sinks into insignificance. The ordinary note is a soft, low plit—uttered as the bird hops about, its long tail carried erect or even leaning forward and jerked to one side at intervals."

Bewick's Wren seems to possess a song that includes several variations. Mr. Amos Butler gives the following interpretation of one of its songs: Chip, chip, te-da-a, te-dee. To him another sounds like cheep, cheep, che-we-e-e-e, while in a third the bird seems to sing to-weet, a-her, cha-chee. Mr. Butler thinks, however, that its most common effort may be expressed by click, click, for-me-e, for you.

Any site, so long as it is a hole or some secluded niche or corner, seems to be a suitable place in which this bird can build its house. Bird or other small boxes, holes in fence posts and roof beams, holes in old stumps, knotholes and hollow trees and many other odd places are alike acceptable. A pair of Bewick's Wrens was known to have nested in an old mantel in an unoccupied house for three successive years. Previous to this period the same pair had nested for two years in an old tin can. Without doubt they would have continued using the can if it had not been removed. Mr. Ridgway has re-



FROM COL. CHI. ACAD. SCIENCES.

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BEWICK'S WREN.
(Thryothorus bewickii).
Life-size

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corded several peculiar sites. "One was beneath the board covering of an ash-hopper; another in a joint of stovepipe which lay horizontally across two joists in the garret of a smoke-house; a third was behind the weather-boarding of an ice-house, while a fourth was in the bottom of the conical portion of a quail-net that had been hung up against the inner side of a buggy shed. None of these nests would have been found had not the bird been seen to enter."

The nest is usually very large and bulky. In fact, its dimensions are often only limited by the size of the hole, crevice or corner in which it is built. A variety of materials are used in its construction. Straw, fine roots, twigs, coarse grasses, chips and feathers are all used in the building of the body of the nest. These materials are matted and held together with animal hairs, fine vegetable fibers and spiders' webs. The lining consists of fine feathers from the barnyard and other soft substances. Both the nests and the eggs closely resemble many of those of the house wren, and, though smaller, are quite like those of the Carolina wren.

Bewick's Wren is willing to be the associate of man. In this environment it is at home and contented. It can care for itself and resents too great familiarity, energetically scolding any intrusion in the vicinity of its home. Often the male Wren enlivens the day by mounting to some high perch on the housetop or the highest twig of some neighboring tree and there expresses its happiness in continuous song for an hour or more.

Isaac McLellan tells of the music of a quiet farmyard in the following lines:

How rich the varied choir! The unquiet finch
Calls from the distant hollows, and the wren
Uttereth her sweet and mellow plaint at times.

THE ROBIN.

He lights on a blossoming pear tree spray
And begins his song without warning—
Cheer up! Cheer up! Clear away! Clear away!
In the dusk of the early morning,
And the petals are falling in broad white flakes,
While robin keeps cheerily calling.
Little cares he if the bent spray breaks:
His wings will keep him from falling.

The little girl wakes from her dreamless sleep
And her blue eyes open in wonder,
For she hears the robin clear and sweet
And she hears the rain and the thunder.
But cheerily now he calls again,
With never a note of repining.
Little cares he for the wind and the rain;
The sun will soon be shining.

—Charles Alexander Richmond.

BERT'S TADPOLE SCHEME.

"Hello there, Harry! Uncle George has come and we're going for a tramp. Don't you want to go with us?" called Bert Andway as he caught sight of his friend cleaning his wheel.

"Indeed! I guess I do. Just wait a minute while I get these things out of the way and some of this black off my hands and I'll be ready," replied Harry.

Uncle George was a great favorite with boys; having never forgotten his own boyhood days he always made them feel that their interests were his own. Soon the trio were making their way over the fields and it was a fine tramp they took through the woods and down the river-road, but the most interesting part came when they were on the way home. They were nearing the little red school-house on the winding-road when they came in sight of a pond.

"Hello!" exclaimed Uncle George, as he first saw it. "Perhaps we shall find something of interest here. Yes," he added, as they reached the water's edge, "the pond is just alive with tadpoles. Have you boys ever thought much about these little polliwogs?"

The boys exchanged knowing looks, then Harry said, "We don't give much for tadpoles this year."

"How's that? What could the little tadpoles have done to have won your disfavor?" asked Uncle George in an interested tone.

There was a moment's silence on the part of the boys, while Uncle George whistled

"A frog he would a-wooing go."

Then Bert said, "Let's tell him all about it, Harry. He won't laugh as the other fellows would if they knew." And soon Uncle George had the whole story.

The summer before the boys had seen a sign, "Frogs' Legs," in a market over town and had learned that they could get forty cents a dozen for them. Then Bert had a scheme for money-making. He reasoned it out in this way. Frogs were hard to catch. Tadpoles were easy enough to get. They could catch them by the dozens, then when they had grown, how the money would pour in!

Harry became his partner. They spent many hours in fixing a tank in Bert's yard, where the little tadpoles were to be put; then they had made several trips to the pond with their nets and had found no trouble in getting all the tadpoles they wanted. But, alas, they had refused to live in the fine quarters the boys had worked so hard to fix, and in a few days they were all dead.

Uncle George listened sympathetically to the story. He was sorry for the boys and wanted to make them see why they had failed.

"What did you feed your tadpoles?" he asked.

"Feed them!" exclaimed both boys in dismay, "We thought they just lived in water."

They were sitting by the edge of the pond and Uncle George leaned over and caught one of the little wrigglers. "I am afraid your tadpoles must have been pretty hungry," he said. "Just look at this little fellow's jaws."

"What horny looking things they are," exclaimed Bert.

"Why it looks 'most as if it had a beak," said Harry.

"That's just what it is," replied Uncle George, and it is horny so that it can crop water-weeds. Tadpoles live mostly on vegetable food. When they get older the beak falls off. Frogs eat insects instead of leaves."

"Do frogs have teeth?" asked Bert.

"Yes, on the upper jaw. The tongue is fastened to the front part of the lower jaw. The forked part which is seen when the frog protrudes his tongue is the hinder part. It is a fine thing with which to seize insects; it is also covered with a sticky fluid, which holds them fast."

"What a curious creature a tadpole is," said Bert, observing the one his Uncle still held, although he was careful to hold it in the water much of the time. "It's something like a tiny fish with its fringed tail."

"Yes, but it's a very wobbly tail," remarked Harry.

Uncle George laughed and said, "That is because there are no fin-rays to support it as there are in the tail of a fish."

"What are those queer little tufts on either side of its neck?" asked Bert.

"Those are gills or breathing-organs," answered his uncle. "After a while they will be replaced by inside gills, and then when the lungs are developed those will disappear."

"What a coming-to-pieces thing a tadpole is!" exclaimed Bert. "Does its tail tumble off, too?"

"Not exactly," said Uncle George. "The hind legs begin to show first, because the gill-covers are over the fore legs; as they grow longer, the tail decreases until it finally disappears. By the time all this takes place the tadpole leaves the water and lives on land."

"How I wish our tadpoles had lived just long enough to have turned into frogs!" exclaimed Bert.

"If they had, do you s'pose we could have kept them?" asked Harry.

"I'm not sure that you would have wanted so many in your yard. Just think how much room dozens of frogs would need. It would have reminded one of the plagues of Egypt, when the ground was covered with frogs and they went into the houses and got into the beds and kneading-troughs," replied Uncle George. "But I am afraid that they would not have stayed in your yard, because frogs like low, moist ground. They might have come traveling back to the pond."

"But frogs couldn't go so far could they?" asked Bert.

"I think they could," replied Uncle George. "I remember my grandfather telling me of frogs traveling half way across the state in search of water. It was in a time of drought and a whole army of frogs got together. They traveled mostly by night and they made such a noise that the farm folks were wakened and many were alarmed, fearing the place was being invaded.'"

"I didn't know that frogs could make very much noise," remarked Harry.

"There is a frog called the blacksmith frog because he croaks so loudly that the noise is like the clanging of a hammer on an anvil, and there's a frog in Peru called the sugar-miller frog because his voice has a grating sound like that produced by a sugar mill," said Uncle George.

"How do you know so much about frogs, uncle?" asked Bert.

"Well, the Scientific Club to which I belong made a study of frogs at one time. You seem surprised," he continued as the boys exclaimed, "but frogs are very interesting to study. I have the skeleton of one at home which I shall have to bring next time I come. It's a wonderful little thing. Even man's own structure is found to correspond with it in many respects."

"Whew!" exclaimed Bert, "I don't wonder we couldn't raise them. I didn't know they were so wonderful. I thought they were very common things."

"But they can be raised, my boy," said Uncle George. "In France and Southern Europe it is quite an extended industry. My business may take me to France next year, and if so I'll visit some of these froggeries and tell you all I can find out about them."

The boys were surprised and delighted to learn that the raising of frogs was really an industry, and Harry asked if frogs were the same all over the world, and they were very much interested when Uncle George told them of a grunting frog in the West Indies five or six inches long, which could jump over a five-foot wall, and of another very large species, much used for food by the natives of South Africa, which is said to resemble chicken when cooked. "Dr. Livingston says that the tribes suppose these frogs to fall from thunder-clouds, because the pools, suddenly filled with water after the thunder showers, became alive with the loud-croaking frogs which have previously been hidden in holes at the roots of bushes."

At this point Uncle George took out his watch and exclaimed: "Boys! Where has the afternoon gone? We must make the best time we can and we may be late to supper at that." And he started off at such a brisk pace that the boys were obliged to run to keep up with him.

A few weeks after Uncle George's visit the postman brought Bert a package which filled him with delight. It contained two little silver frog pins and a card on which was written "For the partners of the tadpole scheme."

"It's just like Uncle George, isn't it, mamma?" said Bert enthusiastically. "He never makes fun of a fellow, but does all he can to make 'em feel comfortable when they make mistakes, and I shouldn't wonder but what Harry and I would go to France and raise frogs when we get through school; anyway we know more about them than we did before Uncle George came, and we are going to know still more before we get through with them."

GRACE T. THOMPSON.

WHEN SPRING AWAKES.

The Spirit of Spring-time was sleeping
  Deep in the ground;
Winter was frowning and weeping
  Over her mound.

The Spirit of Spring-time was dreaming
  Of bud and of bloom;
The sunlight above her came streaming
  To melt Winter's gloom.

The Spirit of Spring-time was waking—
  I hear a bird sing;
The ice on the river is breaking—
  Awake! lovely Spring.

The crocus bulb babies all listened,
  And gently peeped out;
The eye of a violet glistened;
  Tulips were a-pout.

The Spirit of Spring-time was rising,
  Her toilet made;
She comes, for her smile is surprising
  The hill and the glade.

She is here in her beauty before us—
  Bird-voices sing;
And poets all join in the chorus,
  Exclaiming: "Sweet Spring."

—LUCIA BELLE COOK.

FROM COL. CHI. ACAD. SCIENCES.

THE SPOTTED SANDPIPER.

(*Actitis macularia.*)

Across the narrow beach we flit,
  One little sandpiper and I;
And fast I gather, bit by bit,
  The scattered driftwood, bleached and dry,
The wild waves reach their hands for it,
  The wild wind raves, the tide runs high,
As up and down the beach we flit—
  One little sandpiper and I.
—Celia Thaxter, "The Sandpiper."

Few birds have a more extensive range or are better known than the little Spotted Sandpiper. From Alaska and Hudson Bay, on the north, it is found throughout the whole of North America and in winter it flies as far as southern Brazil. Its nest is also well known, for it breeds practically throughout the whole of temperate North America. Though more common in the interior, where it frequents the banks of streams, ponds and lakes, it also visits salt water beaches. On the Gulf coast of Florida this species may be seen in large numbers feeding at low tide among the matted roots. At the rise of the tide they fly to the branches of neighboring trees where they perch in small groups and wait for the receding of the water, when they again begin feeding.

This little bird is burdened with a number of common names which are more or less descriptive of its habits. Some of these are Sand Lark, Sand Snipe, Tip-up, Teeter Tail, Teeter Snipe, Peet-weet and River Snipe. It is a graceful bird in all its motions, whether flying, rapidly running along the sandy beaches or standing, when it "bobs, bows and teeters in a most energetic manner." It is this bobbing and tilting movement of its body and tail that has made the Spotted Sandpiper known to "every lazy fisherman and idle school boy who has whiled away many a balmy and hot summer day along the banks of streams." This habit, too, has inspired the poet. Of this Sandpiper, Mr. John Vance Cheney has written:

Slim, unbalanced bird,
  A-tip upon the sands,
Here's a friendly word,
  A mental shaking-hands.

Ludicrous enough,
  But not more so than I;
Of such teet'ring stuff
  Is all mortality.

The short, sharp notes of the Spotted Sandpiper, sounding like peet-weet or weet-weet, are uttered as it flies. When flushed, it flies over the water to the opposite shore or to a point on the beach directly in advance of the intruder. If followed, it usually returns to the first point, either by flying in a wide circle or directly back. Mr. Abbott has observed that in many instances, if the bird is persistently followed it will fly back and forth between two points, so strong is its dislike to leave a certain locality.

This Sandpiper usually builds its nest on rather high ground, often at some distance from water. It is usually placed in a thin tuft of grass under a shrub. As a rule, the eggs are not well concealed and sometimes they may be readily seen at a distance from the nest. Altitude is not a bar to the selection of a nesting site. In Colorado this bird frequents the streams and lakes at a height of from seven to nine thousand feet or even higher. It differs from nearly all the other sandpiper species in that it breeds not only in the north, but also quite throughout its range.

Mr. Langille has said of the Spotted Sandpiper: "Its well pronounced notes express the very soul of sweet content and cheerfulness. Who could be the victim of care or melancholy, nesting in the quiet haunts enlivened by such sprightly tones! Scarcely less melodious are they than the tender utterances of the piping plover. Indeed, but few of the sylvan songsters can render their strains more suggestively pleasing."

THE SECRET.

A secret deep I learned today;
'Twas shown me in the subtlest way:
I caught it in the whirr of wing,
And from each tiny springing thing—
"The Spring is here and the old earth wakes."

The patient pines rejoiced to hear,
And breathed it to the maples near;
The sleeping willows in their nook
Heard the glad tidings from the brook,
"The Spring is here; 'tis time to wake."

And in a sheltered garden-spot,
Where Winter's throes are soon forgot,
The timid snowdrop struggles up,
And bravely swings its dainty cup—
"Why should I fear? The Spring is here."

The woods are tremulous with wings,
A-throb with the pulse of unborn things,
And, oh! the thrill of the songs unsung,
And the hidden beauty that lies unsprung,
"When Spring is near and the old earth wakes!"

—LEILA LYON TOPPING.

THE ADOPTED KITTEN.

The two sturdy old Thomas cats looked on in amazement when Mrs. Foster brought a strange little kitten into the kitchen. Was not that casting a slur upon the excellence of their companionship to the lady of the house? Perhaps they were in doubt, but at any rate the poor tiny creature was a waif picked up from the road, and the lordly pets that purred contentedly beneath the stove must henceforth recognize a new companion.

Snuff and Old Gray were fed in separate dishes, and that night they were pleasantly engaged at supper when who should approach them for a friendly bite but Snip, the dainty newcomer, wonderfully primped up after a six hours' stay in a home where pets are treated and loved as is their due.

Snip seemed to have taken a fancy to Old Gray, for he passed by Snuff and put his bit of a nose into the former's dish. Instantly the gray cat dealt the presumptuous kitten a violent cuff on the ear. Poor Snip! Shaking his head, he crawled under the sofa and wondered if he had not made a mistake. It was his first experience in outer world society.

I believe it must be said to the credit of Snip that his first failure did not daunt him from making further advances toward his older companion. The next morning he again nosed, though more cautiously, into Old Gray's food dish. Sir Thomas must have been amused despite his impatience, but a second time he administered his rebuke for the cunning little rascal's lack of respect.

However, Snip still persevered, until in two or three days Old Gray not only consented to the two eating together, but actually seemed to enjoy this sharing of his meals.

With these amicable relations thus firmly established Mrs. Foster was much interested one day in seeing her gray mouser come into the kitchen with a limp little morsel in his mouth. His movements were rather hesitating, as though he was acting out of his natural sphere; but it soon became evident that as Snip had no mother, and he could not be a mother to him, he would at least try to act the part of an interested father; and so he was bringing the kitten a mouse.

The gray paused by the little fellow and growled, doubtless inviting Snip to take hold of the game he had caught for him in the hay mow. With his natural instincts aroused, Snip obeyed the invitation and was soon growling in his own tiny key, all of which was to the evident satisfaction of Old Gray, who finally gave up the mouse to his charge.

Thus Snip was taught the simplest lesson of a cat's aim in life at gaining a livelihood, and with much pride in the doings of her pets Mrs. Foster told me of Old Gray's final lesson.

The kitten was dozing in the sun one morning, when he was awakened by the growling of his adopted parent. Looking up, he saw a live squirrel in the jaws beside him. Here was lively game, something he had as yet never attacked. His heart leaped in anticipation. He had no doubt but that the rodent was intended for him. Now the elder cat put one fore paw over Snip's neck and seemed to be instructing him in the aggressive arts. At the conclusion of the lesson the sage teacher the same as said to his pupil:

"Now, Snip, this fine squirrel is for you. It is your duty to conquer and kill it. I shall not help you further; and hereafter you must capture your own game."

Not long afterward Mrs. Foster saw the little cat follow the big one up the road to a favorable position in a stone wall.

Snip was now a mighty hunter in the land of squirrels.

WILLIS EDWIN HURD.

THE ARCTIC TOWHEE.

(*Pipilo maculatus arcticus.*)

The Arctic or Northern Towhee is a bird of high altitudes and latitudes. Its breeding range is somewhat restricted, including the plains of the Platte, Upper Missouri, Yellowstone and Saskatchewan rivers and the regions westward to the eastern slope of the Rocky mountains. In the winter it passes southward, finally reaching the state of Texas. Throughout its range it frequents streams and shores that are bordered with bushy underbrush. In some localities, as in the valley of the Great Slave Lake, this species is very abundant.

Mr. Trippe, as quoted by Dr. Coues in his "Birds of the Northwest," has well described the habits of the Arctic Towhee. He says: "The Arctic Towhee appears in the vicinity of Idaho Springs about the middle of May and in the course of a week or two becomes rather common, though never very abundant. It becomes rare above 8,500 feet and above 9,000 feet disappears altogether, being most numerous from 7,500 feet down to the plains. In habits and appearance it is quite similar to the eastern towhee, but is much shyer and is easily frightened, when it hides in the bushes until all appearance of danger has passed by. Sometimes I have heard it utter the 'chewink' of the eastern towhee, or a note almost exactly like it, though a little lower and more wiry, but its usual call is quite different. It does not sing near as frequently as the latter bird, but when it does acts in the same manner, mounting to the lower limb of a tree and chanting its simple ditty at short intervals for half an hour or more. This song is almost the same as the eastern towhee."

The towhees obtain a large share of their food by scratching among the fallen leaves that lie upon the ground under the underbrush that they frequent. The Arctic Towhee will respond to a whistled call, though it is not as inquisitive as the eastern species.

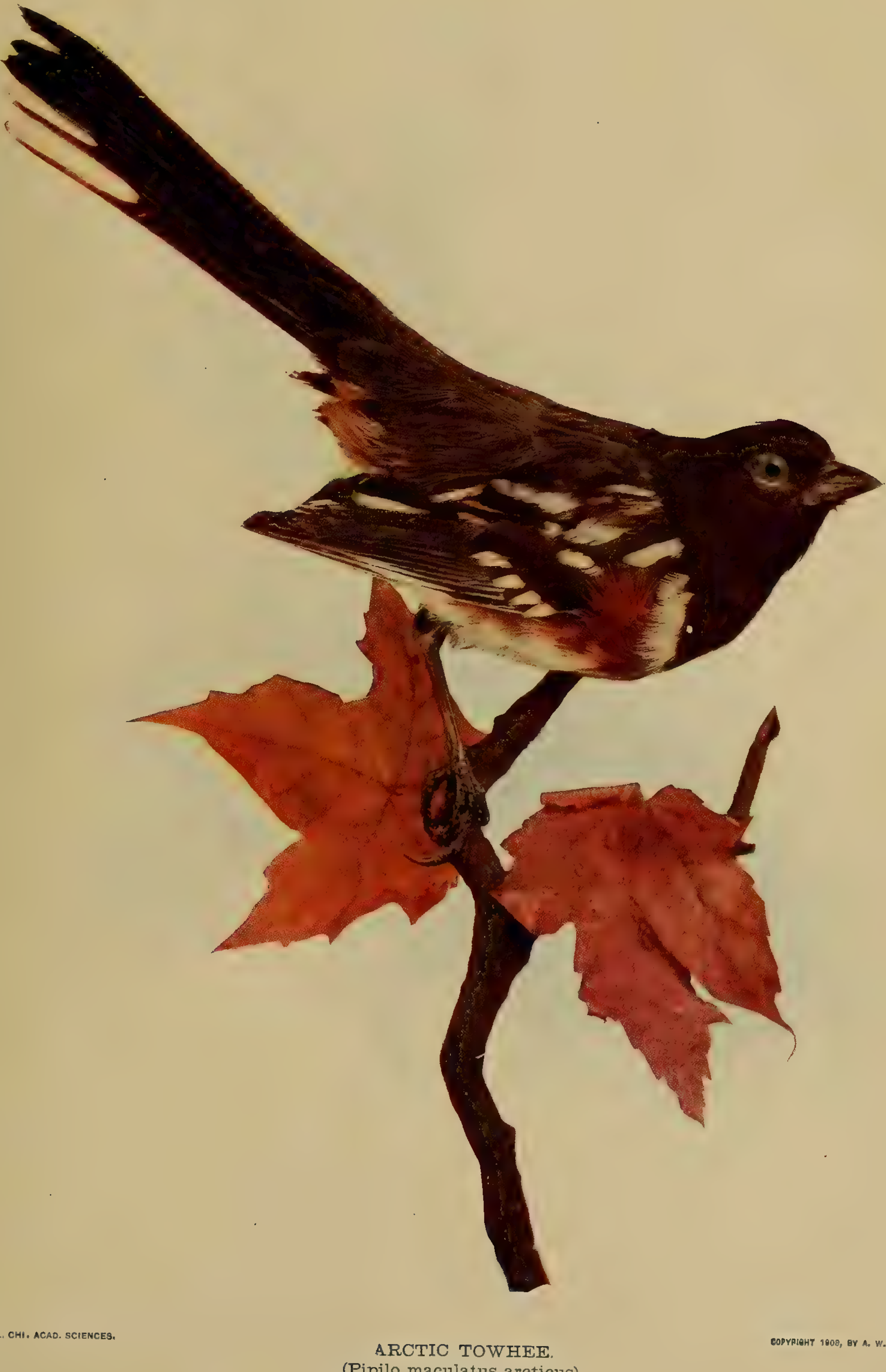
Its nest is placed on the ground in a slight depression scratched out by the bird and is usually under the protecting shadows of shrubs. The nest, the rim of which is flush with the ground, is "strongly built of bark strips, blades of dry grass and usually lined with yellow straw."

MOOSEWOOD.

How its lively and airy branches sway
This beautiful, sunshiny April day!
Now its opening leaves our senses cheer,
And its delicate rose-colored buds appear.

Grand in its solitude near the dark plain,
I visit this old Striped Maple again;
For many a season unchanged it has stood
As if guarding the sugar-camp there in the wood!

—George Bancroft Griffith.



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ARCTIC TOWHEE.
(Pipilo maculatus arcticus).
4/5 Life-size.

WHEN SPRING COMES.

(IN INDIANA.)

"The time of the singing of birds has come," said a great singer years ago.

"The time of the singing of birds has come,"' whispers the south wind as he unbars the rivers and streams.

In this latitude of 40 degrees north, arriving as they do just as the snow melts and ice breaks up, when the first warm days are here, our song birds are peculiarly welcome. Birds of winter are very interesting, and I have no better friends than they are, but their songs are mostly reduced to call notes and they are too busy with the question of a living to indulge in the complex life of spring and summer.

When the weather has been cold for weeks, pond and brook ice bound, snow deep in the woods or piled in great drifts along the fences, it gives a feeling of renewed life to see the ground appear once more and the streams rippling with water. Then the blood flows freer and the heart beats more quickly, in tune with the pulsating life. Then the eye scans the surroundings and the ear listens intently for the songs of spring.

Generally the first bird to appear is the bluebird. The last few days of February will probably be the time of his arrival or if the winter be late, the foremost days of March. The first intimation will probably be a sweet song in the air "cherut," "cherut," or maybe you will catch sight of a blue backed, most intensely blue, cinnamon breasted bird perched on the fence. He is not timid, though the earliest arrivals will be shy at first. But watch and they will soon be frequent visitors about the house and yard. This applies to a certain extent to the houses of towns and villages and the suburbs of cities. The sweet singer has only a few notes, but these make in quality what they lack in variations.

The meadow lark comes about this time and, true to his name, generally frequents the meadows and pastures. His coat is the same color as the dead stubble, and it takes a keen eye to discern the author of that beautiful song. But stroll that way and at the quick whirr of wings notice the grayish back, widespread tail with white quill feathers and if he wheel about, the beautiful yellow breast with black crescent. A bird of the meadows, he certainly is, for there he builds his nest and there he passes his life.

Maybe on the very same day the bluebird came, robin red-breast appears, plump and dignified, ready to dispute with any of these plebeian sparrows for the right of a home in the piazza or in the apple tree on the lawn. Though others of his family may prefer the "sweet seclusion of the woods," Mr. Robin prefers to rear his family right in the confines of civilization. To his mind there is less danger from cats and small boys than from hawks and squirrels.

February seldom draws to a close without the presence of the purple-grackles. Whatever other failings blackbirds may have, you can always see and hear them. Right into your shade or apple trees they come, making a great racket, that, as Mr. Burroughs says, is like "pepper and salt to the ear." Few birds have a more striking plumage than the crow blackbird. Watch one of them strutting about some fine April morning. The name blackbird is not descriptive. He is purple, bronze and violet, and the sun's rays falling on his feathers give a most striking effect. These four birds generally come in February in this latitude, though the state of the weather may retard them some. This year I saw the bluebirds and blackbirds in February, but the other two did not come until March.

Closely following these comes the song sparrow. He looks much like the other sparrows, except he has a dark spot on the breast with lines converging towards it. By nature fitted for a life in the fields and meadows, he seldom ventures far from them. It is difficult to tell the migrant from the resident, but they come north at this time. If any wonder should arise as to the name go and hear him sing once.

About the same date the plover or killdeer reaches home. He is distinctively a bird of the fields and shows his kinship to birds of the plover family by his peculiar cry and funny way he has of running about. These birds will all probably be here by the 10th of the month, though they vary some. Then comes the red-winged blackbird. There is no trouble in seeing the red spot on the shoulder of the male and salmon on the shoulder of the female. Lowell has aptly described the song when he says, "The redwing flutes his oak-a-lee." For that is just what he does, plays a wonderfully sweet-toned silvery flute that has in its rendering the sweetest of melody.

About this time the cowbird comes north. He is distinguished or rather disgraced by the practice of polygamy. Each of the dark males may have several of the brown females for wives. Then, in keeping with this lack of morality, the female lays her eggs in some other bird's nest, preferably a vireo or warbler's nest. They take their name from the habit of following cattle about and feeding on insects disturbed by them. The next to come will in all likelihood be the chewink. Though he is mostly a bird of the woods, yet he sometimes ventures within city limits. A slight acquaintance with this black and brown bird will soon show whence his name comes.

March will be almost to a close, maybe April will be here before the vesper sparrow and pewee arrive. When the evenings are growing long and twilight lingers mellow the vesper sparrow delights to perch on a stone in some field and sing his song to the passing day. You would hardly suppose that the sparrow which darts from one fence corner to another, showing those two white quill feathers, could be such a sweet singer. But listen some evening and you will understand what John Burroughs says of the vesper sparrow.

Now come the first of the flycatcher family, the pewees. They go south because it is so difficult for a member of that family to find a supply of food in cold weather. It is no trouble to tell whence the name comes. About here they are among the most numerous of birds. You can tell a pewee not only by its cry but from the curious habit it has of always alighting on a dead branch. Though I have noticed them hundreds of times, I have yet to see one select a living branch.

Who does not know that tiny brown bird with long slim tail, that sings so sweetly from the fence or roof of the house, the house wren? There is no question but that he believes in civilization, for the small brown mother will come right into the shed and build a nest in some basket or box, or in an old coat or piece of carpet. Cats are their worst enemy, but they prefer grimalkin to the danger of hawks. He sings with all the bubbling energy of the wren family, and it is surprising how much music can come from so small a bird.

The kinglets now give us a visit on their northern journey. Sometimes I have watched them through the softly falling snow and again among the apple blossoms, though they generally reach here when the maples are in flower. The golden-crown is the most common about here; at least I have seen but little of the ruby-crown. Though they do not sing until reaching their northern home, they are well worth the time spent in studying them.

Now the birds come in steadily accelerated waves—the brown thrush, the fox sparrow, the white crowned sparrow, the white throated sparrow and the chipping sparrow. The last named is the smallest of the sparrow family. Notice a very small sparrow with a red cap edged with white. He is not a sweet singer, but trills away by the hour, it seems.

But the brown thrush! Who does not know him? As we have all read in the old school reader,

"There's a merry brown thrush sitting up in
the tree,
He's singing for me. He's singing for me."

As April draws to a close the swallows come again. I believe that every one who has a chimney has at some time seen and handled that queer-looking, sticky shallow nest that belongs to the chimney swallow. It is such a delight to open the pipe-hole and peep in at the queer-looking little sooty swallows clinging against the side of the grimy chimney.

The barn swallow is even more interesting, at least more graceful, as he wheels and circles about over the pond or meadow. As far as flight is concerned he is unrivaled among our song-birds for freedom and ease of movement. And when the sun falls aslant his steel blue back, few birds can excel him in beauty. That barn is always lonesome which has no swallows twittering about its eaves or building nests in its comb. During the month of May there is a perfect army of birds arriving by daylight and by starlight moving northward as irresistably as if drawn by magnetism.

The flycatchers are here now at the head of which stands the kingbird. Probably no one has ever given so exhaustive a study of the kingbird as Mrs. Olive Thorne Miller in "Little Brothers of the Air." Close to the kingbird stands the great crested flycatcher. When you have clearly seen and heard him once you will not longer wonder whence the name comes. The remaining members of the family I know but little about, though some of them are said to be common in this part of the state.

When driving along the road if you notice a sparrowy-looking bird with brown back and wings and yellow throat, who throws back his head and sings as if his heart were bursting with joy, you may note down the dicksissel. Though a bird of the meadows, he always comes to the roadside and perches on a fence stake to sing for the passer by as if it were a duty he owed society.

I believe everyone knows the catbird, that slate-colored bird which sings so, only he will stop occasionally to utter a perfect "mewmew." But in spite of that feline leaning he is a hearty songster, and one that our shrubbery would sadly miss.

It is difficult to tell which is the most admirable, the Baltimore or the orchard oriole. The former is the most breezy and has more of the spirit of dash and freedom in his actions and singing. His house is suspended from the outmost twig of an elm tree, and there his children are rocked by every passing breeze. No wonder a bird reared in such a manner is lively. His cousin is quieter and the coloring more subdued; his coat is black and red where the other is black and orange. He does not sing quite so loudly, but he has a very sweet voice.

Of that glorious family of singers, the thrushes, but one, the wood thrush, remains here. The others all pass farther north before selecting a home. You must seek the woods, for the name aptly describes him, and the wonderful song heard on a calm evening will well repay any exertion to reach his haunts.

Only one grosbeak, the rose-breasted, ever stays here; the others pass on. This one is a beautiful musician, being a fair rival of the wood thrush. Bradford Torrey even thinks them to be superior to the thrushes.

About the middle of the month come the cuckoos; the yellow-billed and the black-billed. The former is more abundant though the latter is not scarce. Both of these birds are better known as the "rain-crow," and powers of foretelling storms are imparted to them.

One of the last birds to come is the bobolink. The very name suggests riotous merriment. The bird of sunshine and of summer showers, a person never thinks of him as being anything else. When the clover is the sweetest and the summer days the pleasantest, then the bobolink is in his happiest moods and bubbles over with joy and gladness. It is a delight to watch the merry minstrel as he frolics about over the meadow or floats down to a swaying timothy stalk.

There is a peculiarly striking little bird known as the indigo bird, and the name well describes the color, for it is a deep indigo blue. In my mind he is associated with the clearest skies and the hottest suns. Nor will you have to look long to see the exact counter-balance of the indigo bird, the scarlet tanager. No need to describe him. When you see a ball of fire gleaming through the green leaves you know that the scarlet tanager has arrived. Perhaps you may overlook the plainly dressed mates of these brilliantly colored birds, the bobolink, the indigo bird and the scarlet tanager, but you may rest assured these brave young gallants do not.

Now, welcome to the vireos, that modest family of small, olive-green birds that frequent trees and sing so steadily; especially the red-eyed vireo, for whom the weather never becomes too hot or dry. Methodically he chirps away, indifferent to the quivering heat. The warbling vireo probably has the most musical voice, though I am not very well acquainted with other members of the family.

In early May, perhaps before April has gone, comes the whip-poor-will. He is rather shy, and I studied birds a long time before I was certain of him. But I think everyone who has lived in the country or even visited there in summer knows him by his voice. Maybe some day when you are walking in the woods and see a gray protuberance on a rail or fallen log, if you will go up to it you will be surprised to see it fly silently and gracefully away. Then watch, and if it should, notice the fine, short beak and you may know you are looking at the whip-poor-will.

Before all these named have arrived some of the warblers will be here. I have intentionally left them till near the last, that I might speak of them all together. They are very difficult to identify, for there are so many of them and vary both as to sex and age. Some of the more common are the golden-crowned thrush, the redstart, blue-gray gnatcatcher, Maryland yellow-throat, black and white creeping warbler, magnolia warbler and Blackburnian warbler. Many others have been chronicled by naturalists of this latitude, but these are the ones of which I am most certain. The redstart, black and white creeping warbler, blue-gray gnatcatcher and Maryland yellow-throat are quite common about here, especially the latter. "Whe-che-tee, whe-che-tee, whe-che-tee" comes from the bushes that line our ditch-bank or some pond, and soon I catch sight of a small olive-green bird with a yellow breast hopping from twig to twig, apparently oblivious to me or anything else except what immediately concerns him. The blue-gray gnatcatcher is more nervous and shows the restless warbler habit of flitting from twig to twig. His name will describe his color. Then there is the redstart, a mixture of red and black, which seems to have a mania for tumbling about in the air, though he does manage to find time to build a home and rear a family.

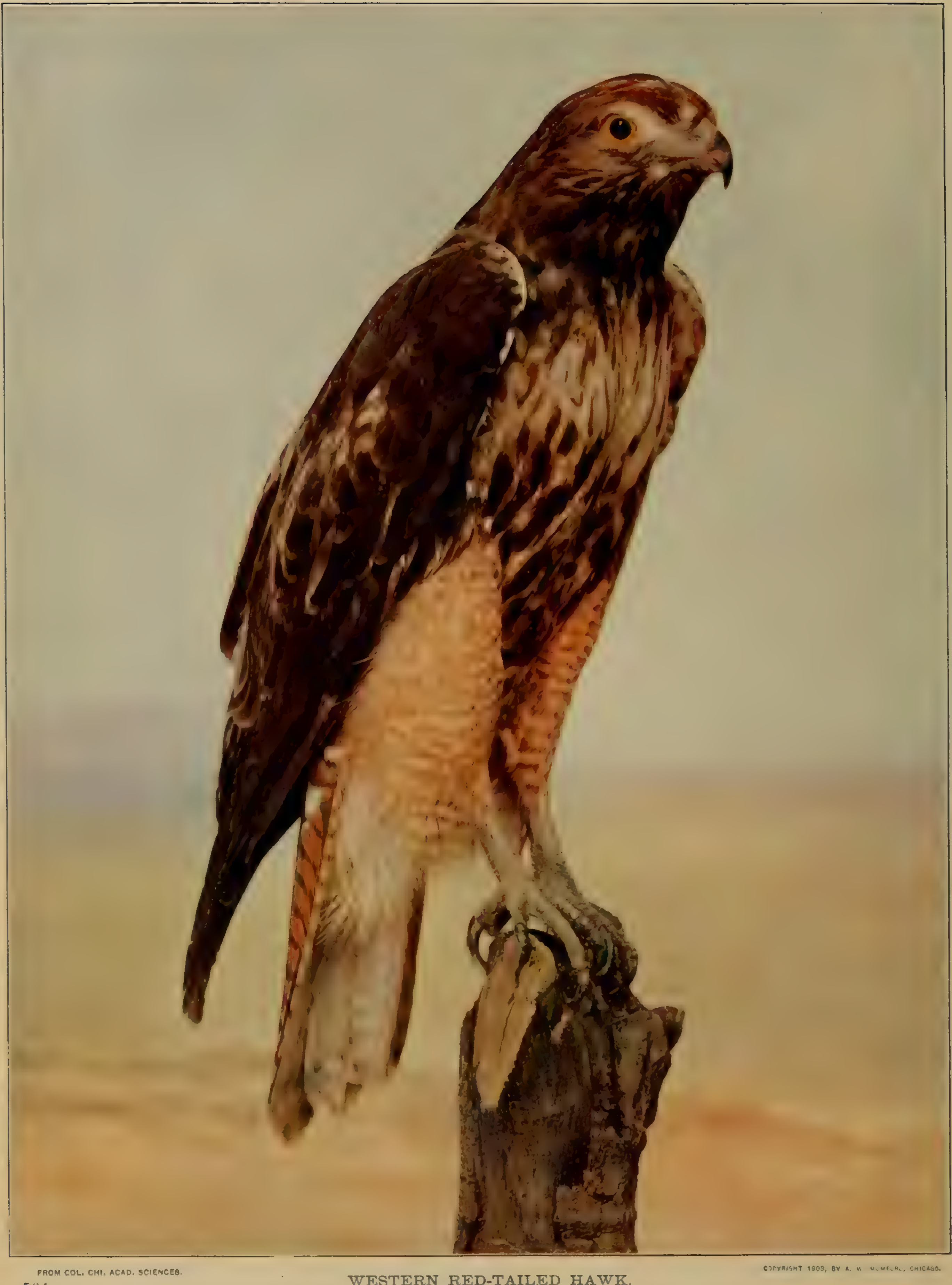
The last to arrive generally is the ruby-throated hummingbird. When the honeysuckle blooms rest assured that the ruby-throat will be here soon. Or, if you do not have the honeysuckle, a trumpet flower will do, some kind of a blossom with a long, deep corolla. By the time he comes migration will be over. In this article I have made no mention of the water or game birds. Of the former I know very little, as I have no chance of observing, there being no river or lake for some distance. Of the latter but very few migrate through our neighborhood that I know about, the only ones being the woodcock, besides wild ducks and geese.

The foregoing list is not exhaustive by any means, but they are the more prominent birds whose habits and disposition I have been observing for the past few years.

It is with the same pleasure that I record the first migrant for 1902 and watch the oncoming of the great army that will so soon be here. To anyone who has a love of nature implanted in his breast, the making of a few notes on birds and flowers will be a pleasure that grows with him as the years pass and his knowledge increases. Especially if he can say "yes" to Emerson's query:

"Hast thou named all birds without a gun,
Loved the wild-rose and left it on its stalk?"

WARREN T. HIGGINS.



FROM COL. CHI. ACAD. SCIENCES.

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WESTERN RED-TAILED HAWK.
(Buteo borealis calurus)
$\frac{2}{5}$ Life-size.

THE WESTERN RED-TAILED HAWK.

(*Buteo borealis calurus.*)

The Western Red-tail is but a darker variety of the red-tailed hawk so common in the eastern portion of North America, where it is commonly called "Hen Hawk." The western form has a long and narrow range covering that part of North America between the Rocky Mountains and the Pacific Ocean and passing southward into Mexico. As a casual visitor, it has also been observed east of mountain system. It is only a summer resident in the northern part of its range. It is one of the earliest of the migrating birds to return to its nesting localities in the spring and one of the last to wend its way southward in the fall. Living in a mountainous region and soaring over verdant fields where innumerable cattle are feeding, no words seem more fitting to its character than those of the poet when he says:

And yonder hawk, who fainter grows
  Above the hills and grazing herds,
Is symbol of the season's close,
  The last of the departing birds.

In its habits the Western Red-tail very closely resembles its eastern relative. "It is fond of the tall timber bordering the banks of streams, and is as often found far in the mountain passes and deep canyons as in the more open country in the foothills and the adjacent plains, but seems to shun the dense and extensive forests and is rarely seen excepting on the borders of these." Though usually found in the vicinity of water courses it has frequently been observed in desert regions some distance from any stream and has been known to nest in such localities. Their call notes are very similar to those of the common red-tail and consist of "shrill squeals, uttered during the greater part of the day while circling high in the air." These notes are especially noticeable early in the season as it circles "high in the air in proximity to its future summer home." A striking characteristic is its attachment to a locality where it has nested. To this site, it apparently returns from season to season. Nests have been found that were evidently repaired and added to, year after year, and in some cases the lower sticks had become decayed.

Though its nest is sometimes placed very near the ground, it usually builds at a height of from twenty-five to fifty feet, and nests have been observed in the tops of gigantic redwood and pine trees that were not less than one hundred feet above the base of the tree. Several species of trees are acceptable to this Hawk as a place for its home, and it has also been known to build its nest in a species of gigantic cactus. When suitable trees are not to be found, the Western Red-tail is equal to the emergency and will occasionally be satisfied with a cliff or the "sides of a perpendicular bluff" upon which to construct its home. There is a record of such a nest that was built on the side of a chalk bluff in southern Colorado. It was situated at a point "seventy-five feet from the bottom and twenty feet from the top of the bluff."

Though this species does occasionally attack poultry and other birds, the name "Hen Hawk" should never be applied to it. The number of domestic fowls and wild birds that it destroys is very small when compared with the large number of the noxious smaller mammals and grasshoppers which it kills. When grasshoppers are common, they form this Hawk's chief article of diet during the months of late summer and early autumn. The Western Red-tail is a friend to the agriculturist.

A PLEA FOR THE SPIDER.

Possibly the moral of that tragic poem, beginning:

> "'Will you walk into my parlor?'
> Said the spider to the fly,"

which was formerly impressed on the mind of every well-regulated child, is partly responsible for the abhorrence with which members of this ill-fated race are viewed. Whether our methods of obtaining a livelihood are so superior as to warrant such intolerance might be questioned, but certain it is that spiders have long been the victims of persecution. Out of doors the birds lie in wait for them; within, the housekeeper's broom is in readiness, and not only are their webs torn down as soon as spun, but they are fortunate if they escape with their lives. No ones takes their part but the naturalist, and he goes about armed with a bottle of alcohol, into which he pops any unfortunate specimen he chances to admire.

Naturally, spiders in general are timid and retiring in disposition, keeping as much out of sight as possible. Yet they are by no means an insignificant race. One page of mythology is devoted to their origin. Tradition states that many centuries ago there lived a maiden so distinguished for her skill in the arts of weaving and embroidery that she scorned to be called less expert than Minerva herself. That goddess took the form of an old woman, and, descending from Mount Olympus, called on Arachne and reproved her for her boasts and impiety. Arachne haughtily replied that she would challenge even the goddess to compete with her. Although taken somewhat aback when Minerva dropped her disguise, she refused to retract and the trial began.

Arachne chose for the subject of her embroidery scenes drawn from stories relating the faults and errors of the gods. These were beautifully executed, but Minerva's were still finer, and poor Arachne, filled with shame and despair, attempted to destroy herself. Minerva, seeing her hanging from a tree, commanded her to continue to hang as a warning to future generations. Immediately she began to grow smaller and smaller; her fingers attached themselves to her sides as legs and she ran off across the ground, a little black spider.

Her descendants are named Arachnida from their ancestor, and the curse still clings to them, for they remain hanging. They do not seem to object to the position, however, having become used to it.

They all possess her wonderful powers of spinning and weaving. No human artificer can compete with the fineness and beauty of their webs; hundreds of the strands joined together not equaling in size a human hair.

The early life of a spider has something of the tragic about it. The infant Arachnida are enclosed in a nest, which, however soft and silken it may be, still effectually keeps them confined. As they thrive and grow it becomes probable that the "survival of the fittest" is the rule in their case. Yet their parent is not unmotherly, for she stays to guard her offspring, not seldom losing her life in their defense.

This time of trial being past and the little prisoners released, they begin to take an active part in the world. Like all children, they outgrow their clothes, but new ones are less a problem than in some families. When Master Arachnida finds his coat too small he simply withdraws into retirement while he splits it open, throws it off and discovers another already grown underneath.

As soon as they are old enough the young Arachnida set up housekeeping for themselves. According to spider etiquette it is the female part of the community which does the work, while the masculine gentry live at their ease. The former first take care to provide for their sustenance by spinning a web and then proceed to build a house. With some this is a very dainty affair, the soft cup-shaped dwelling looking comfortable enough. Others, still more aristocratic, build quite extensive houses for themselves, plastering them on the outside, lining them with silken tapestries and constructing at last a trap door, so arranged that it can easily be held down from the inside.

One species, fond of travel, is in the habit of making air-voyages. Climbing up on some plant so that the wind may easily take them, they shoot a long thread into the air. This is seized by the wind and the little creature rides before the breeze as long as he chooses. Unfortunately, they are no more successful than other aeronauts in guiding their balloons, and as frequently come to grief. Voyagers approaching land sometimes meet clouds of them driven out to sea.

Other varieties choose the water as their element, some merely gliding over its surface in search of their prey, and others making dwellings for themselves entirely submerged. These are constructed something in the shape of a thimble, woven so closely as to keep out the water and an opening left at the bottom for the entrance of the occupant. These are said to be furnished with air in a rather curious fashion. They are fastened to the stems of aquatic plants. Down these the spider crawls, the air being entangled in the long rough hairs of its body, it allows it to escape into the nest and returns for another supply.

Spiders are each provided with a poison gland for offense and defense, but the danger from their bite is said to be much exaggerated, and in most instances to be no more cause for alarm than that of the mosquito. Their instincts are remarkable. The fact is generally overlooked that they really exert themselves to the advantage of the human race, ridding the house of flies and the earth of many insects pernicious to agriculture. They should be regarded as man's friends, not his enemies.

Elizabeth Miles Derrickson.

APRIL.

Poets sing of May day flowers, the perfect days of June, of September's balmy weather and October's dreamy haze; but they ring the changes of April on "showers and tears, sunshine and smiles" until we have come to think of "April showers that bring May flowers," more than we do of Nature's resurrection which April brings.

It is April that awakens the forests from their mysterious winter sleep that brings back our birds from distant lands; that breaks the icebeds from the streams; that turns the brown, dead chrysalis into beautiful, airy wings; that calls to all hibernating life, "Come forth and join the chorus that 'Life is ever Lord of death.' "

Other months may bring more perfect weather, warmer sunshine, brighter flowers, greener fields and deeper shadows; but none bring to our hearts a gladness like that of an ideal April day. We have passed the winter months with a degree of pleasure, despite their snows, their frost, their sleet and winds; despite the absence of bird music, flower odor or forest color. But when we feel the warmth of April sunshine, see the leaf-buds bursting into green, hear the first notes of robin or bluebird and scent the odor of violets, then indeed comes into the human heart a touch of that joy which we imagine will be felt in that land where death and its semblance never come.

Caroline H. Parker.

THE NESTING HABITS OF THE AMERICAN WOODCOCK.

The Woodcock belongs to the family Scolopacidae, which also include the snipes and sandpipers. This is a large family of one hundred or more species, about forty-five of which are resident in North America.

The American Woodcock inhabits the eastern portion of North America from the Atlantic coast westward through the United States to Kansas, Nebraska and Dakota. In the Canadian Provinces the appearance of the Woodcock is somewhat erratic. They have been observed breeding in New Brunswick, Ontario and Manitoba.

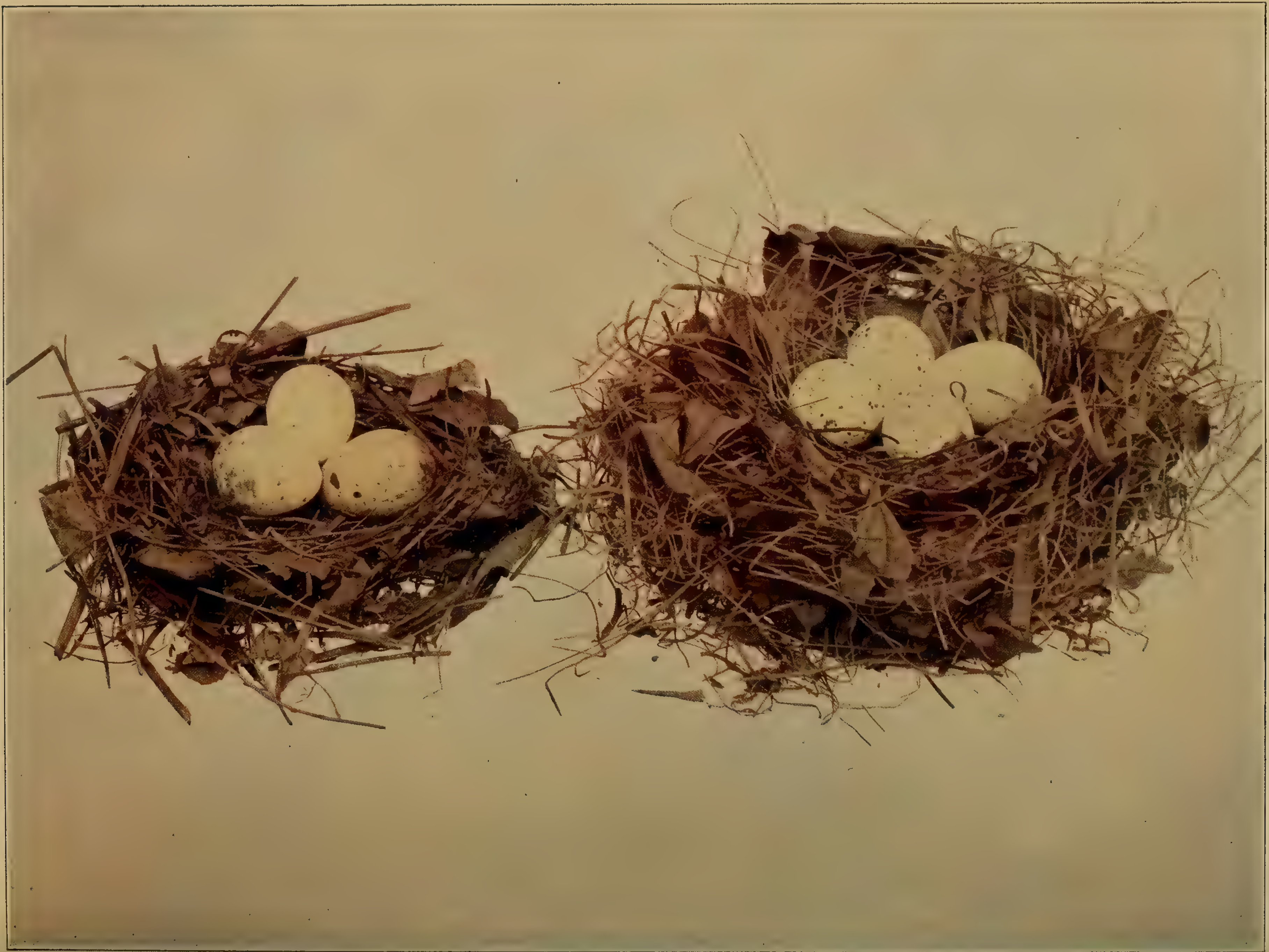
The old adage, "There are exceptions to all rules," can be appropriately applied to the habits of the Woodcock, when comparing it with other members of the snipe family. What person unacquainted with the habits of this odd bird would think from the appearance of his long legs and bills that the Woodcock prefers the woodlands and dense underbrush of the hillsides to the open marsh. However, it frequently betakes itself to the shores of lakes and small streams, especially in very dry weather. In northern Illinois and Indiana the Woodcock's favorite haunts are among the timbered hillsides, especially in localities where litttle springs emerge from the underbrush, affording excellent concealment and an equally good feeding ground.

Its food consists of earth worms and larvae which they procure by boring in the soft earth. The Woodcock is capable of moving the tip of the upper mandible, and thus it is able, with remarkable ease, to withdraw its food from a depth of several inches.

The Woodcock is inclined to be very nocturnal in its habits, both when feeding and migrating, and this peculiarity has justly earned for it the title of "The Owl among snipe." It is a hardy bird, occasionally spending the winter as far north as southern Illinois. In the vicinity of the Great Lakes the Woodcock arrives from the south in March and soon becomes paired and is nesting by the first of April. In Mississippi and Louisiana the young have been found as early as the 20th of February. In Indiana the eggs have been found as early as the last week in March. The latest record I have regarding the breeding of the Woodcock is from Georgetown, Prince Edward Island, where on the 17th of August, 1888, a pair was observed breeding.

A peculiar and interesting characteristic of the Bog Sucker, a name frequently applied to the Woodcock, is the song flight which the males indulge in during the mating season. The performance can be witnessed about dusk and usually in close proximity to the nesting place. The male bird arises from the brush with a whistle of the wings, the sound increasing in rapidity as the bird circles about, continually rising to a greater height, until the climax is reached, and it is about two hundred feet above the ground. Now commences the descent with greater rapidity and another sound issues forth, this time from the mouth, and as the bird nears the earth the notes develop into a mellow warble and with a swoop, the male drops out of sight amid the brush, usually but a short distance from where he arose.

During a period of three or four years I made several excursions annually during March, April and May in the hope of finding a Woodcock's nest, but without avail, though I seldom failed to see the birds. At last I was successful. One balmy afternoon in April I was in the timber near where I had spent the day studying bird migration. Several white crowned sparrows were frolicking about in a willow bush, and in order to obtain a better view of them I started for the opposite side of the bush and glancing down I beheld in a slight hollow of dead leaves the remains of four eggs, which



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told the tale of a newly hatched brood of Woodcocks, I stood, seemingly mesmerized for a moment, over what was indeed a meager reward for my years of search, but I had accomplished one thing, which was the positive location of its breeding grounds. There was considerable satisfaction in this discovery and I now longed for the approach of another spring, in which I hoped to be more successful.

The following year, with a sixty miles an hour gale blowing from the northeast, I started on a typical March day for the Woodcock reserves, as I called them. When I entered the brush, how I thrilled with the prospect of finding a Woodcock's nest this time, before the eggs were hatched! I made a bee line for the spot where last year's nest was located, but saw no trace of bird life except a few juncoes that were scratching about in brush heaps. It seemed as if I had examined every foot of ground in the grove and was about to depart, when a sudden wh-r-r-r-r-r caused me to leap to a height that would do credit to a college athlete. This surprise was due to the flushing of a Woodcock, which with rapidly beating wings rose almost perpendicularly to a height of about ten feet before starting off on a peculiar zig zag course, only to travel a few yards when she again dropped out of sight amongst the willows.

A thorough search failed to reveal either nest or eggs. It was probably too early. This place was revisited a week later and although Mrs. Woodcock was at home, a careful search of the premises disclosed nothing, oölogically speaking, and this caused a little uneasiness on my part. Was I to be outwitted again? At the expiration of another week, I made a third trip to the reserve. Several Wilson's snipes, near relatives of the Woodcock, flew from a pond as I neared the grove. They were only migrants and would probably travel hundreds of miles before entertaining any thought of parental duties. After foraging about in the shrubbery, a Woodcock soon flushed, and with renewed vigor the hunt commenced in earnest. Only a few minutes elapsed before I was kneeling over the four eggs, laid on a bed of leaves. The eggs, as is characteristic with the shore birds, were arranged with their points toward a common center.

This nest was twenty-five yards distant from that of the previous year. The eggs were fresh, highly polished, with subdued markings of lilac and pale brown about the larger half. The nest and four eggs here described are shown in the accompanying illustration.

With the naturalist, it is the first specimen of any variety that is the most difficult to obtain. After this experience with the Woodcock, to locate other nests was a comparatively easy task, and be fore the expiration of the month I had the pleasure of examining seven different nests. In two instances the incubating bird sat very close, permitting herself to be touched before leaving her eggs. So closely do the birds harmonize with their surroundings that they appear to have great confidence in the protective coloration, and this combined with the fact that they are preferably birds of the night, rather than of the day, accounts for their tame disposition. They sit much closer on a bright day, than at sun down or in early morn.

The nest of three eggs which we illustrate was found between two wagon tracks bordering timber, during the latter part of April and the eggs were perfectly fresh, although within fifty yards of this nest, four young Woodcock had just left their shells and the mother was piloting them about among the undergrowth. These three eggs are heavily dotted and spotted over the entire surface with reddish brown and lilac. Both the sets above described lack the conspicuous red blotches, which occur on many the "black sheep" of his family.

The Woodcock is an extremely interesting bird and possesses so many individual traits and peculiarities, which distinguish him from other members of the Snipe tribe, that he may be justly termed the "black sheep" of his family.

Gerard Alan Abbott.

THE WOODCOCK'S WOOING.

At ordinary times, and in his ordinary moods, there is nothing very striking or remarkable about the woodcock. For genuine honest homeliness and for the lack of all the graces and accomplishments that should belong to a courtier, he can find few peers. He has no gracefulness of flight, no gaudiness of plumage. He has no melodiousness of voice. In short, he seems to lack all of those elements of joyousness and grace which we usually associate with bird life. He never skimmed through the air like a swallow. He does not know what it means to alight upon a swaying bough and spend his spare moments taking an exhilarating teeter. His children, even, never experienced the delight of rock-a-by-baby upon the tree-top. If you come near without frightening him you are likely to overlook him altogether, or mistake him for a chunk of half-decayed wood, and if you frighten him he simply throws himself away as you might hurl a club through the air. He is as devoid of lofty aspirations, even, as he is of other attractive qualities. In his habits of life he is pre-eminently a bird of the earth. He is a plump, long-billed, bob-tailed brown affair who goes down into the marsh, sticks his bill into the soil for a root, and grows after the fashion of a plant.

But there is a time when his whole nature changes. In the most delightful part of the most delightful evenings of the year, that is, in the early evenings of the latter part of May, when the influence of the warm, fragrant dusk prevails to just such an extent as to leave the outlines of objects half undefined and toned down to that degree of dimness most suggestive of witchery, then the loiterer of the lanes, if he is in the vicinity of any marsh, is likely to become witness and auditor to a woodcock's wooing.

He hears above him a rich succession of the most entreating, most coaxing notes imaginable. He looks up to discover the source of the music, but the singer is wholly hidden in the dusk. The experience of hearing such distinct and ringing music out of a clear and empty sky is both unique and pleasing; for to the charm which the song possesses by virtue of its melody is added the subtle charm of mystery.

The song soon comes to an end, and in a few moments the listener hears a "spzzzp (cluck) spzzzp, (cluck) spzzzp," coming at intervals of about half a minute from a neighboring marsh. A few minutes more and he hears a sound of swift wings, accompanied by a low clucking. He looks in the direction from which the sound comes, and can perhaps make out a dark object arising rapidly and at a low slant from the earth. He has discovered the singer. If he is attentive enough and clear-sighted enough to watch the motions of the speck of darkness so dimly defined against the dusky sky he can see most of the performance. As the bird ascends in a gradually closing spiral, the rich succession of clucking, entreating notes increase in rapidity and intensity; the entreaty becomes more pronounced and to it is added tones as of ecstacy. When the singer has reached the upper limits of his flight he simply gyrates about and palpitates like a heart that has broken loose. His notes become so intensely entreating that it is difficult to understand how the one he is asking for can hold out so long. At last the song reaches its climax and the listener holds his breath and hopes, yet fears for the bird's sake, to have him go on any longer. And when the interest in the song has become almost painful in the effect it produces the bird suddenly falls, breathless and swiftly as an arrow to the earth. It is possible to see him start, but before he has reached the ground he is falling so rapidly that the eye cannot follow him: Down in the marsh you soon hear a "spzzzp, (cluck) spzzzp, (cluck) spzzzp" a while, and then he takes another flight.

To those who know the story of his

courtship, he makes a stronger appeal to the sympathies than almost any other bird, although in his ordinary hum-drum life he never attracts much attention except that of the man with the gun, and so he has never entered into our thoughts and literature as the more conspicuous and domestic birds, as the robin and bluebird and swallow. It is more than likely, too, that his very plainness, which makes his everyday life so inconspicuous also, by way of recompense, makes him so conspicuous during his wooing. Homely lovers are always the most interesting. They know they can count very little on their good looks to help them, and so have to get down to strenuous effort. The gaudy jay, the flaming oriole and the brilliant red bird never have to do the hard work that the woodcock, so pathetically homely, does. Really during those charmed evenings when we hear him sing we fall to wishing she would refuse him or put him off indefinitely. Then we might have him singing all the year; that is, if he didn't pine away and die.

There is such a bit of humanness about it all that we almost feel he is akin to ourselves, and when we see how at the touch of the True Romance his commonplace life is lifted up into the heights of splendid song, it makes us think of what has happened again and again in our own race. We are reminded of the sonnets of Petrarca and the Divina Comedia, and I know not of how many other things. Not only us, but as that splendid invocation to the True Romance has said:

> "Devil and brute, Thou dost transmute
> To higher, lordlier show,
> Who art in sooth that lovely Truth
> The careless angels know."

If only for the sake of that brief season, our legislators should enroll his name among that of our songbirds and protect him all the year round. For even if he is a juicy morsel the jail is good enough for the sort of man who would deliberately sell his right to hear the woodcock's evening hymn for a mess of pot pie.

After the courting business is all over, what a sad relapse comes to our friend, the serenader! Here he is human, too, or rather he is here too human. He gives up his habits of soaring and of song. He goes down to the marsh, sticks his bill into the soil for a root and grows, after the fashion of a plant.

H. WALTON CLARK.

THE BEAUTIFUL MOTHER.

Along the marshy river's winding sheen
The egret flies her ample nest to make,
By levee's narrow path or shallow lake,
On some warped limb, where ragged old oaks lean.
Below, the glist'ning wave in flow serene,
The willow shadows, where the low reeds quake,
The crushed canoe forgotten in the brake,
And wide afield alfalfa's living green.

The little egret, stranger of the Spring!
The rare white heron with the phantom wing!
Among the reeds she stands with love-warm breast;
The keen plume-hunter waits, his spoil to gain;
Blood stains the sand, and on the warped limb's nest
The motherless and starving cry in vain.

—LILLIAN H. SHUEY.

THE NESTING WOODCOCK.

Once during my boyhood days, while I was busy in a clearing picking up chunks, I met with a startling surprise. One chunk, which looked for all the world like the others, suddenly projected itself through the air as if hurled upward by some unseen hand. In another moment, however, I recognized the whirring sound of a woodcock in flight, and on looking at the spot from which the bird had arisen, saw the nest, a shallow depression containing four rather large mottled, sharp-pointed eggs.

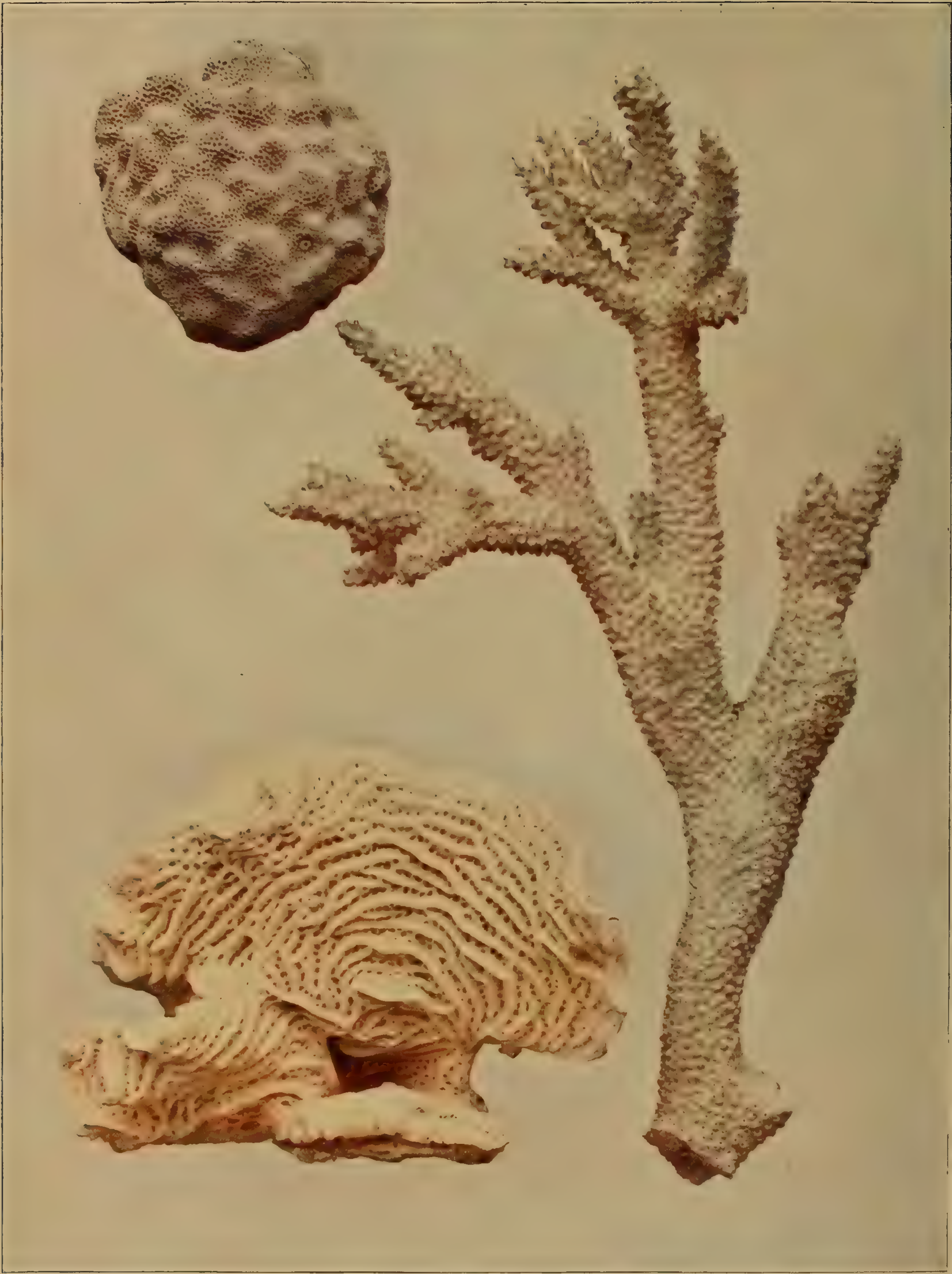
It was a favorable place to observe the bird on the nest. There were no bushes to obscure the view from any direction, no twigs to crack startlingly beneath the tread, and few leaves to rustle. So I carefully noted the location and retired from the place. Afterward, on different occasions I would drift over to the vicinity of the nest and busy myself with picking chunks so as not to excite the suspicion of the bird, and watch her while I worked. Upon approaching the place I would fix my eye on the spot where I knew the nest to be located, and would always see what at first sight appeared to be a brown piece of half-decayed wood. It was only after some moments of constant gazing that the object took definite shape and the different features, consisting of one watchful eye and a few stripes of brown, became distinguishable. If, during the process of watching the bird, I took my eyes away for only a moment, a glance in its direction showed only an ordinary chunk, which must once more be scrutinized into definite form.

There was always a sense of keen pleasure in that process. In the first place, there is the sensation of capturing the elusive; for a clear, distinct picture of the bird sitting on the nest is one of the most tantalizingly fugitive things imaginable. It is indeed this sensation of striving after the subtle and ever-escaping impressions that is the joy and inspiration of every art. It has embodied itself in the tale of Pan's mad chase after Syrinx "men and gods, we are all deluded thus," and the secret of the sweetness of the melodies that lie just beyond the edge of hearing. Then there is again the sensation of a triumph over Nature in discerning what she has so long and effectively attempted to conceal. It is winning a game of hide-and-seek against a creature that is its own hiding-place. It is like watching a miracle again and again to see the bit of wood transfigured into a bird, and it is to taste, without any sense of shrinking or fear, the feeling of wonder that Moses must have felt when he saw his rod become a serpent.

The position of the bird on the nest is as interesting and significant as her color markings are. There seems to be an instinctive attempt on her part to blot herself out of sight by an assumption of the most inconspicuous attitudes possible, and yet to let nothing come within her range of vision without being seen. The long bill is hidden beneath the feathers; the head is cuddled down close and laid on one side; one alert sleepless eye seems to be the center of the bird and the whole horizon, and scans the different avenues of approach.

I made the experiment of working around the bird in a small circle, watching her motions at the same time. By a noiseless and almost imperceptible movement of the head the eye followed me throughout the complete circle of my movements. There was no craning of the neck, no painful twisting of the head nor any sign of discomfort or uneasiness, but by simply rocking the head over to the other side and bringing the eye that had been hidden into play her view commanded the latter half of my circuit.

H. Walton Clark.



FROM COL. CHI. ACAD. SCIENCES

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REEF BUILDING CORALS.

Porites astraeoides (Florida).

Agaricia agaricites (Bahamas).

Madrepora prolifera (Florida).

CORAL REEFS.

If a map of the world is studied carefully a peculiar fact will present itself. With several minor exceptions the Coral Reefs and coral islands of the globe are confined to a belt-like area bounded on the north by the Tropic of Cancer and on the south by the Tropic of Capricorn. This singular distribution arises from the fact that reef-building corals live only in seas in which the temperature during the winter months does not fall below sixty-eight degrees Fahrenheit. It has been ascertained that the mean temperatures for the Pacific Ocean are seventy-three degrees for the North Pacific and seventy degrees for the South Pacific. It will thus easily be understood why such a restricted area should be given to Coral Reefs. An interesting exception to this rule is the Bermudas, the reefs of which are made possible by the warm waters of the Gulf Stream.

When we examine the area within the two tropics we find the condition still more interesting and peculiar. The coral belt, if we may so designate this portion of the globe, is divisible into three main areas of distribution. The first is the Pacific Ocean, which is the largest. The second is the Indian Ocean, and the third includes the Gulf of Mexico, the Caribbean Sea and the Brazilian coast. The Pacific Ocean is the metropolis of Coral Reefs. Here the temperature and depth of water is particularly favorable. The Atlantic Ocean, on the contrary, is the least adapted for the growth of corals and consequently but few reefs of importance are found there. The west coasts of both the Americas and of Africa are almost devoid of Coral Reefs, while the eastern shores of those continents embrace large areas. This is due to the cold extra-tropical currents of water which flow from the arctic and antarctic toward the equator on those sides of the continents. The coast of China has no Coral Reefs for the same reason. Another barrier to the growth of Coral Reefs is found along muddy shores or the vicinity of the mouths of large rivers, for coral polyps cannot live except in clear sea water. Regions of volcanic action are also devoid of Coral Reefs, for evident reasons. Depth plays an important part in the distribution of Coral Reefs. It has been found that coral-building polyps do not flourish below one hundred and fifty feet. Hence the Coral Reefs are always found on top of submarine islands and on the shallow margins of islands and continents.

Of the larger corals the Madrepores are in the main the true reef-builders. There are over sixty species of this genus, each colony of which grows to a large size. The largest number of species is found in the Pacific Ocean, where they also attain their greatest perfection. In Florida and the West Indies the Meandrinas or brain-corals are the most conspicuous reef-builders, although several large species of Madrepores also form reefs, an example being the Madrepora cervicornis shown on the plate.

Coral formations may be conveniently divided into two kinds or classes: First, coral islands and, second, Coral Reefs. The first class includes those isolated formations which occur in the open sea and which are formed on top of submerged mountain peaks. The coral island is usually in the form of an atoll, which is a rim of coral rock surrounding a central salt water lake or lagoon, communicating with the ocean by one or more openings. Such lagoons are always of an irregular form, generally longer than wide, and, curiously enough, are never circular. In size these atolls vary from a few miles to over fifty miles in length, the smaller ones lacking the lagoon Some of these islands are perfectly bare and are swept by the sea at high tide, while others are well wooded. The wooded portion generally lies to the windward and affords an excellent protection for shipping if the lagoon is large enough for a harbor, as is frequently the case. Each side of the rim of the atoll forms a coral sand beach, which is generally bare at low tide and beyond this the edge is bordered by living corals to a point not exceeding one hundred and fifty feet in depth.

The Coral Reef is not entirely composed of living, or even dead corals. The base upon which the corals are living is as hard and compact as any limestone, and the rock of the beach is equally as hard and is formed by the cementing together of the coral sand grains. Frequently a pudding-stone or conglommerate will be formed by the addition of pebbles of various sizes and not infrequently a beautiful round white rock called oölyte is formed, each sand grain being covered by a calcareous cement. Hence is the name oölyte—egg like. The coral rock has different characteristics according to the position in which it is formed. For example, the rock formed in the lagoon is very compact and contains no fossils, while the rock formed on the ocean side is made up of broken pieces of coral, shells, etc. When it is formed in a sheltered place subject to the action of the sea, the rock contains the embedded corals in the positions in which they grew.

The history or biography of a coral island is as follows: As soon as a submerged mountain peak is within one hundred and fifty feet of the surface of the ocean the corals begin to grow and in the course of time a vast number of these corals have grown up to the surface of the water. With the corals there also live mollusks, echinoderms, crabs, bryozoans and a host of other marine animals. When the coral structure reaches the surface the waves begin their work. The strong winds tear up and break off the corals, pile up the fragments and by their constant motion reduce them to sand. This work continues until a large extent of reef and beach is formed. The under portions become consolidated and form the hard coral rock. The living corals continue growing along the margins of the newly formed island. Thus an island is constructed from the bed of growing corals. As soon as the sand is fine enough to make good earth the seeds of various plants or trees, blown from other islands, perhaps hundreds of miles away, become planted and growing give to the island a covering of vegetation. The windward side is always the highest, because the winds act strongest on this side and pile up the debris from the reef. Islands such as the one just described are constantly forming in the Pacific Ocean, as well as in other Coral Reef seas.

Coral Reefs are those which border an island or continent and may be divided into two kinds, fringing reefs and barrier reefs. The first kind are formed along the edges of the island or continent, while the barrier reefs are formed at some distance from the main land with a body of water, frequently of considerable depth, separating them. Many of these fringing and barrier reefs are of large extent, and Mr. James D. Dana, who has made an extensive study of Coral Reefs, gives the following dimensions of some well-known localities: The Fiji Islands reefs are from five to fifteen miles wide. Those of New Caledonia lie for one hundred and fifty miles north and fifty miles south of the island, making a total length of four hundred miles. On the northeastern coast of Australia the reefs extend for one thousand miles, at a distance of from fifty to sixty miles from the coast. These reefs do not, however, all reach the surface of the sea, those portions, which may be seen, being in isolated patches here and there, and many of them are visible only at low water. The largest of these exposed patches does not exceed two miles in width.

For a long time the cause of the peculiar form of the atoll was unknown, but a number of years ago, Mr. Charles Darwin proposed the following plausible theory, based on numerous facts, and now generally accepted. This theory presumes that the Coral Reef began as a fringing reef on the shores of, or surrounding an island. This might be, as it is known to be the case with some islands which are submerged mountain peaks. After the coral had formed a fringing reef the island began to slowly sink into the ocean, the coral meanwhile growing upward as rapidly as the island sank, until a barrier reef was formed. This subsidence or sinking continued until the top of the island disappeared and a Coral Reef was built upon it. If the original island was the top or crater of a volcano, like Oahu in the Hawaiian islands, then after it had subsided and the corals built reefs upon its summit, we would have a belt of Coral Reefs surrounding a body of water, or in other words, an atoll. As the water about some of the Coral Reefs in the Pacific Ocean is a thousand or more feet in depth (a notable example being the Fiji Islands, two thousand to three thousand feet deep) this theory is the only one which will give a satisfactory reason for their form and position. Coral islands are very numerous in the larger oceans, there being about three hundred in the Pacific Ocean, and a large number in the Indian Ocean. The Laccadives and Maldives, in the Indian Ocean, are said by Dana to be the largest coral islands in the world. The vicinity of Coral Reefs affords one of the best localities for the study of marine life. Other animals take advantage of the favorable conditions under which the corals live, and make their home either in or on the reefs. Mollusks crawl over and bore into the corals, sea anemones attach themselves to the coral rock and gorgeously colored sea-fans grow in the crevices between the corals. Starfishes, sea urchins, clams, worms, crabs, lobsters and a host of other forms make up the inhabitants of these tiny worlds. Fishes of many colors swim about over the reefs, and as Prof. Louis Agassiz once said, "will compare with the most beautiful assemblage of birds in tropical climates." These animals are constantly dying and their remains aid in forming the solid parts of the reef.

FRANK COLLINS BAKER.

AN APRIL FOOL.

Little Hepatica lifted her head;
"A glorious nap I've had," she said;
And, raising herself, she rubbed her eyes,
"I wonder if really 'tis time to rise."

Her wintry garments she pushed aside,
But, with disappointment, almost cried;
For, stretching her arms preparing to grow,
She found all about her a sheet of snow.

So down she lay for another nap
In the snug embrace of Nature's lap;
Took a wink, looked up, and all was clear:
The birds were singing far and near.

Hepatica laughed as she donned her gown,
And said to the Sun, who was smiling down:
"Dame Nature will keep me some time yet at school,
Till I learn to translate an April Fool."

—GRACE E. HARLOW.

EASTER AND THE EASTER LILY.

The Easter Lily is the symbol of a ceremonial which is older than history. It illustrates a story as old as humanity, one which tells of feasts to the Great Spirit in gratitude for the return of spring or for a bountiful harvest. Unlike other primitive observances which have become obsolete, or more recent forms of thanksgiving which have no relation to the past, the Easter festival has been handed down through the ages, replete with religious significance to almost every race of mankind. Probably the earliest recorded observance of this ceremonial was when the Hebrew, Arabian, Phenician and Assyrian herdsmen offered sacrifices to the Great Spirit, to ward off danger and disease. On the plains of Babylon, these herders of sheep and cattle became the first astronomers, being guided by the stars and recording the lapse of time by the phases of the moon. Thus in process of time the days of the new and full moon, became holy days to the people of the Semitic race and were so observed for centuries during the most flourishing periods of their history.

Hence it transpired that the moon became the symbol of an overruling providence and when the vernal equinox returned the first of the flocks were sacrificed to the moon god and their blood sprinkled on the lintels of the sheep folds, that pestilence and disease might not prevail.

The vernal equinox was thought to be a season when the Great Spirit came more closely to his children than at other times. The sun warmed the ground, the floods subsided and the earth became alive with germinating seeds. In Egypt at this season a huge serpent was supposed to wander over the earth, drinking the superfluous moisture and warming the ground.

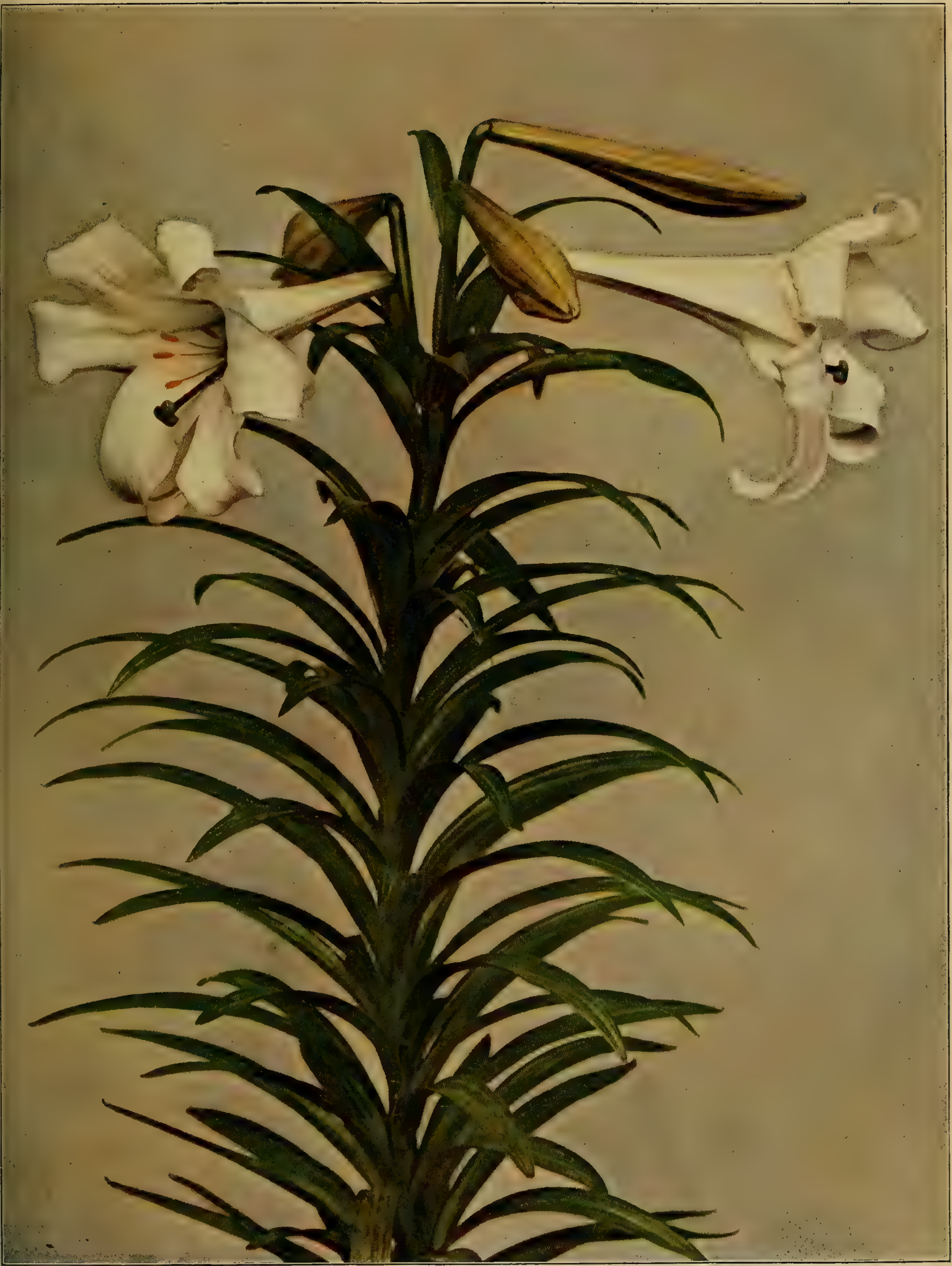
At a later period in Hebrew history the worship of the moon god was replaced by sacrifices to Yahweh, but still the firstlings of the flocks were offered up and their blood sprinkled on the lintels of the door posts. At this time, however, the thank offerings were for deliverance from Egyptian bondage.

Thus the ancient Hebrew Pesakh passed through the Paskha of the Septuagint into the Latin Pascha, which is still the Latin name for Easter and has a variant in the English Paschal. From the Semitic feast it passed under Aryan influence and acquired the Aryan name.

The final passover when Christ was crucified on Calvary, constituted the closing Hebrew observance and inaugurated another, still in force. When the Teutonic influence began to be exerted in Roman life, the observance of the festival became somewhat uncertain. This was due to the fact that the Teutonic people had no national celebration of a similar nature, their periods of thanksgiving being regulated by communities. In turn, however, the Roman Pascha became permanently changed to the Teutonic Easter, named from the festival of the goddess Ostara, which combined the ancient customs of invoking blessings on fire, marriage and the fields.

This blessing of the fire was a Vedic ceremony to welcome the dawn and disperse the night demons. It still survives in the "Muckle Wheel" of Scotland, the "Need Fire" of England and the "Holy Saturday of Germany." The relics of the blessing of the marriage relation may be still found in the Silician sale of girls on Easter Monday, the shoe-pulling in the north of England and the Hampshire hockings.

The blessing of the fields was by far the most ancient and the most closely related to the original observance of the occasion. It was, however, largely done away with during the Reformation and Puritan movement. In Germany, nevertheless, the cattle are still stroked and the fields swept with holy palms. The cosmic egg of Babylon and Assyria is still perpetuated in the English Easter



PLANT LOANED BY COM. OF LINCOLN PARK.

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EASTER LILY.
(Lilium harrisii).
2/5 Life-size.

AMERICAN COLORTYPE CO., CHI. & N. Y.

egg. German peasants often place eggs and loaves of bread into the fields to secure a fruitful harvest and for a similar purpose, Easter eggs are rolled over the fields in certain parts of England.

The Pongol festival in India, to welcome the rice crop; the feast of the Zulus which occurs in December, when a bullock is sacrificed and the formal opening of the harvest in certain parts of England, before the crop is cut, are all survivals of the aboriginal sacrifices to the Great Spirit to secure good harvests and immunity from pestilence.

The Roman custom of celebrating their festival with flowers and songs, has been maintained by the Catholic Church to the present day. The profusion of garlands of the past have given way to flowers typifying purity, as better fitting the spirit of the occasion, as it is now observed. Hence it naturally came about that the lily was chosen to symbolize the sacred associations that cluster around the Easter observance.

In 1875 a beautiful form of the lily family was brought by a woman to Philadelphia from Bermuda. This lily (Lilium longiflorum) at once obtained great popularity by reason of its unusual size, the large number of flowers on each stem and their extraordinary beauty and purity. The imported plants were soon bought by Mr. W. K. Harris, of Philadelphia, who named it the Lilium harrisii, but at the present time it is known as the Lilium longiflorum variety eximum.

The great beauty of the flowers, the fact that the plants mature early in the season, and their ability to endure a high temperature, allowing them to be forced to bloom during the winter all combined to make this lily the universal choice for the typical Easter flower, which position it still worthily maintains as though conscious of the deep significance of the festival of which it is the chosen floral emblem.

Charles S. Raddin.

A BOTANICAL SCRAPBOOK.

One of the most valuable of all books, yet one that the poorest may readily possess, is a scrapbook in which the student of any particular subject may preserve all items and fugitive articles of especial interest discovered in the course of his daily reading.

The botanist, especially, will find a well kept scrapbook of inestimable value, for in it he can place many articles describing new discoveries, or rare species, in the plant world. These often appear in the newspapers and magazines, and otherwise would be lost, or at least occasion a prolonged search, if wanted for reference.

In accounts given by travelers and explorers one can often find descriptions of rare discoveries, with which are furnished illustrations from photographs not otherwise obtainable. One young girl made a practice of looking over the periodicals at the library every week, and when a botanical article appeared, she bought that particular number at the news-stand and transferred the article to her scrapbook. In this way she kept posted on all new discoveries and investigations, and gained a great deal of fresh information, while at the same time a reference library of no mean value was accumulated.

To obtain the best results, some order must be observed in the disposal of the clippings, Separate portions of the book must be allowed for the various divisions of the subject; or what it better, have several volumes; one, say, for trees, one for ferns, another for myths and folklore, etc., or any other divisions suiting the fancy of the compiler.

Regular botanical journals, of course, should not be mutilated, but preserved whole and each volume bound with the index, which is usually given at the end of each year, or volume.

Elma Iona Locke.

SPRING PEEPERS.

Sweet sounds are now breaking the long winter silence
  Like tiny bells ringing so liquidly clear.
I heard the first note where the soft pussy willows
  Were airing their gray furs above the pool near.
How spring-like it sounded, half plaintive, yet cheering;
  And hinting of blossoms and mellow bird songs,
        Of Maytime soon coming,
        With tawny bees humming.
  For to the first peeper spring's keynote belongs.

The fresh pungent night air of budding young April
  Seems throbbing and pulsing in musical haze.
On soft winds the voices are coming, then going,
  O'er brown boggy marshlands and willow fringed bays.
How high pitched and shrill rings the piccolo chorus,
  Sustained by the sucker toad's heavy trombone.
        Now rising, then falling,
        In silver tones calling
  From tussock to tussock, that Winter has flown.

When comes a spring shower, with swift, coaxing murmur;
  How suddenly silence falls over the throng:
Till up from a single throat leaps a clear jingle note;
  Then, as if raindrops had turned into song,
The whole air is teeming with fifings and flutings
  And little bells mingle with musical clacks,
        As though they made merry,
        And felt happy, very,
  With April showers patting their olive brown backs.

The skunk cabbage flower, with hood like a friar,
  Comes up from earth's cloister to view his old place.
No one can see just how this frog-music suits him,
  He wears his dark cowl so far over his face.
But cat-tails and rushes and dark alder bushes
  Are thinking of putting on green clothes again.
        Hail, little spring peeper:
        No music is cheaper
  Nor sweeter than yours is, when spring decks the plain.

—BELLE A. HITCHCOCK.

MAIZE OR INDIAN CORN.

(*Zea mays*, L)

And still later, when the Autumn
Changed the long green leaves to yellow,
And the soft and juicy kernels
Grew like wampum hard and yellow,
Then the ripened ears he gathered,
Stripped the withered husks from off them,
As he once had stripped the wrestler,
Gave the first Feast of Mondamin,
And made known unto the people
This new gift of the Great Spirit.
—Longfellow: Hiawatha, V.

Maize, or Indian Corn, also known as corn, Turkish wheat or corn of Asia, is a plant belonging to the Grass Family (Gramineæ.) It usually attains a height of about seven feet the single unbranched stem being jointed, only slightly tapering, with a central pith and an outer hard, mechanical tissue to give the necessary mechanical resistance to heavy winds, a structural characteristic common to the stems (or culms) of members of the Grass Family. Each node (joint) has a single long, sword-like leaf, the lower portion of which encloses the stem (internode) like a sheath. A characteristic of corn and other gramineous plants is to form shoots or stolons, that is, secondary stems are sent up from the base of the parent stem. The stolons are more generally wanting, when present they vary in number from one to three or four, that depending upon climatic conditions and cultivation.

Corn is a typically monoecious plant, that is, the staminate (male) and pistillate (female) flowers are borne upon different parts of the same plant. The large, feathery panicle at the top of the stalk, generally spoken of as the "tassel" or "tossel," represents the staminate inflorescence. The pistillate inflorescence formed near the middle of the stalk consists of a dense spike of flowers of which the styles are greatly elongated, forming what is commonly known as the "corn silk." The female inflorescence is enclosed by numerous broad, leaf-like bracts which is known as the "husk." The fruit, known as the "ear," is collective, several hundred individual fruits usually designated as "kernels," being fastened to the spike, commonly known as the "cob."

Corn flowers are not showy, as pollination is effected through the agency of air currents, and in common with other anemophilous (wind-pollinated) plants. large quantities of pollen are formed. On walking through a corn field in August one will find the ground yellow with the pollen dust. The fruit ripens in the autumn, usually shortly before the frosts set in in the temperate climates.

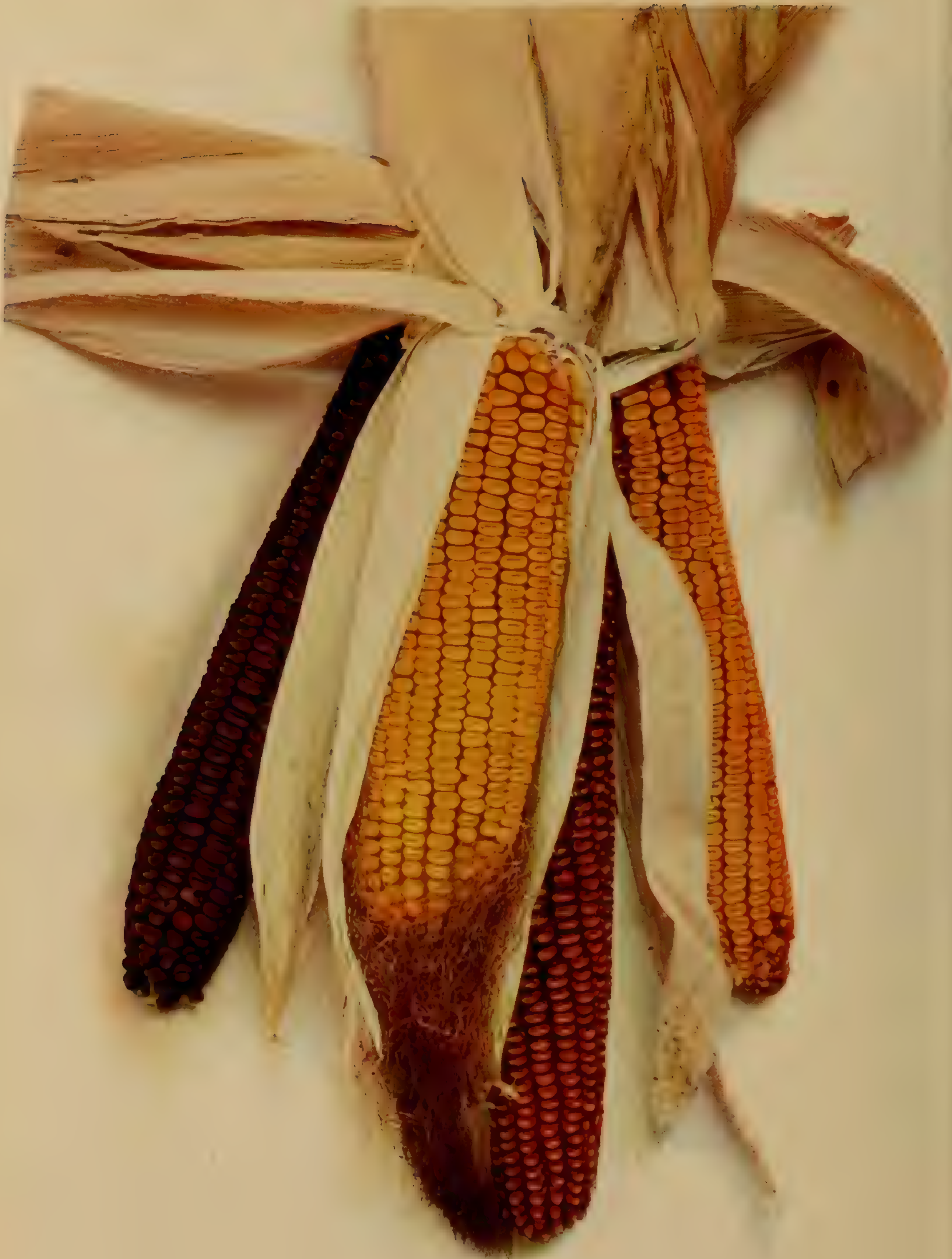
As with many other domestic and cultivated plants, the wild ancestor of corn is unknown. It is most probably a native of tropical America. Some give Hayti as its native home; others give South America (Peru). Small grains of some unknown variety of corn have been found in the ancient tombs of Peru. Some authorities, however, are inclined to the view that it came from Asia (Ruel and Fuchs). Santa Rosa de Viterbo states that the Arabs brought maize into Spain about the 13th century. A drawing of corn is found in a Chinese work on natural history (Li-chi-tchin) which dates back to 1562, a little over sixty years after the discovery of America. Corn is not figured on Egyptian monuments, nor was any mention made of it by Oriental travelers in Africa or Asia prior to the 16th century. Bonafous, however, states that maize had been cultivated from a very ancient period in the Asiatic islands under the equator, and that it was received thence into China and so passed westward into India and Turkey, hence the names "Turkey corn" and "Corne of Asia," given by Gerard in 1597. Both Berard and Bonafous think that it came from the east, but on the discovery of America it was introduced into Europe from that country. Humboldt and others, however, do not hesitate to say that it originated solely in America. It had long been cultivated there at the time of the discovery of the New World.

At the present time corn is extensively cultivated in various countries and islands, but nowhere on such an enormous scale as in the Mississippi valley and its larger tributaries. The Mississippi corn region, with Springfield (Illinois) as its centre, produces annually from 1,000 to 15,000 millions of bushels, or about three-fourths of the total crop of the United States. In the Central States corn is cultivated on a large and simple scale, made possible by the rich soil. One man with three horses cultivates from 80 to 100 acres, besides oats and other farm products. Corn requires rich, black, loose soil with good surface drainage, and special climatic conditions. The season must be warm, with ample evenly distributed rainfall, and nights must not be cool. For example, England and the Pacific countries of America and high altitudes are not suited because of the cool nights. The plant is quite susceptible to frosts and large tracts are not infrequently damaged by late spring and early autumn frosts.

The soil is ploughed, harrowed and then the corn is planted in rows, either drilled (single grains about six to ten inches apart) or planted in hills (three to five grains) about three feet apart. The hill check method is preferred. The young plants begin to appear above the surface of the soil in from four to six days, and after having attained a height of about six inches the corn is cultivated by means of special cultivators, known as corn plows, with the rows and crosswise, if checked. This cultivation is repeated three or four times. At the last cultivation, spoken of as "laying the corn by," it has attained a height of some four feet and nothing further is done in the way of cultivation. In the fall the leaves and stalks turn yellowish brown, the ears with the reddish brown dry silk and the leafy bracts become more pendant and after a few frosts have set in, the corn is pronounced in a fit condition for "husking," or "shucking." In this process the ears are separated from the stalk, removing at the same time the leafy bracts and most of the silk. The method of "husking" corn differs somewhat in different localities. In the central states the farmer enters the field with wagon and two horses, lets the horses and wagon straddle a row of corn already husked, with another husked row to the left of the wagon, and he "takes" or "husks" two rows and throws the husked ears into the wagon one by one, urging the horses on as he makes progress. The horses are easily controlled, as they feed upon the dry corn leaves and an occasional ear overlooked by the husker. The development in the skill of corn husking is quite interesting. Some thirty or forty years ago, when corn was cultivated on a smaller scale, a good husker could not husk more than from 20 to 30 bushels per day; at the present time a good husker collects from 80 to 100 bushels per day.

In some localities, especially the east and south of the United States, corn husking is done differently. The farmer may simply "snap" the corn, that is, remove ear, husk and all, convey it to his barn and husk it later by inviting his neighbors to a "husking bee." This method is looked upon as ridiculously childish by the more active and energetic farmer of the central states. Or he may haul the wagon to the field, return the horses to the stable, and husk the corn into a basket and then empty the basket into the wagon. There are corn husking machines upon the market, but none which are of any great practical value to the small or individual farmer.

There are a multitude of varieties of corn—no one knows how many—and new varieties are continually being produced by the progressive farmer and by the scientific investigators at the various experiment stations of the United States. The numerous varieties of what is known as "white dent corn" are now most extensively cultivated in the central states. Some thirty years ago the yellow variety was preferred. The small, hard kerneled "flint" varieties, to which pop corn belongs, are cultivated almost entirely for food purposes. The Indians of Yucatan bake it into cakes called "tortilla," and in Ireland it is made into a kind of porridge. The "sweet corn" varieties are cultivated almost wholly for eating direct or for canning. The various varieties mix or cross very readily. For example,



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CORN
(Zea mays).
About ½ Life-size.

pop corn planted near any other variety crosses with it (by cross pollination and consequent fertilization), and it becomes absolutely worthless for popping purposes. To prevent this, the farmer must plant his pop corn in a separate field far enough removed from other corn to prevent crossing. The farmer selects and perpetuates a desirable variety or quality of corn by artificial selection. That is, during the husking season he picks out ears having the desirable qualities (large ears with comparatively small cob and deep kernels) and keeps these for "seed corn." The scientist at the experiment stations above referred to aids nature in the production of new and desirable varieties by artificial selection combined with artificial pollination. That is, the pollen of one variety of corn is removed and deposited on the ends of the silk of another variety, performing what is known as artificial crossing. Northern states, for example, could only cultivate an early variety, that is, a variety which would mature in a comparatively brief season. There are also hardy varieties, those which are less readily affected by slight frosts. Varieties comparatively richer in proteids and others richer in starch, etc.

Since corn requires rich soil, manuring and fertilizing of the soil is a very important item. The old time use of guano, manure and other chemical fertilizers is laborious and expensive. Experiments are now in progress to utilize certain bacteria for this purpose, and the results thus far obtained point to ultimate success.

With perhaps the one exception of rice, maize is the most extensively used grain in the world. In fact, all parts of the plant are used. The leaves, green as well as dried, before fully ripened, form an excellent fodder for horses and cattle. The young, green, juicy plants are greedily eaten by hogs and nearly all the larger herbivorous animals. For fodder purposes corn is often sown broadcast, when it will produce only a few scrawny ears, cut while still green, dried directly or first allowed to undergo a form of fermentation (ensilage) and then dried, and finally stored in the barn or in the field in "shocks." More generally the ordinarily planted corn is cut before fully ripened, either by hand or by a machine, shocked, and the ears removed before feeding the stalks and leaves to cattle. Sometimes the fodder, ears and all, is chopped into small bits by means of a special machine run by horse power or steam power. The stalks are also used in paper making, and in fertilizing the soil. At one time efforts were made to use the juice of green stalks in making corn molasses, sugar and glucuse, but this enterprise proved a commercial failure. The silk of the ear has been and is still used medicinally. It is official in the Pharmacopœia of the United States, but will be excluded in the forthcoming issue (1900). The husk is used in mattresses and the finer, more delicate bracts are used as a substitute for cigarette paper. The poor farmer occasionally smokes the silk as a substitute for tobacco, and it is occasionally used as a filling for small pillows.

The most valuable part of the corn is the fruit, generally spoken of as the grain, or kernel. Green corn, that is, the ear before it is ripe, when boiled is highly relished as an article of diet. Although its food value is certainly overestimated, as it is hard to digest, not infrequently causing serious bowel derangements. It should be thoroughly boiled and eaten with salt and butter. For this purpose sweet corn is preferred. Canning boiled corn removed from the cob is a very important industry in the United States. Canned corn mixed with beans is known as succotash. Hominy, a favorite dish of the more civilized tribes of the American Indians, as well as the white inhabitants, consists of the entire grain from which the hull (seed coat) has been removed by special processes, as soaking in some alkaline solution. Corn is rich in proteids, starch and fat, but does not make good bread. A mixture of rye and corn meal makes an excellent coarse bread formerly much used in the Altantic states and still extensively used in parts of Portugal and Spain. Mush consists of boiled corn meal, and is eaten with milk and sugar and fried. Corn bread, hoe cake, corn cake, are considerably used, especially in the southern states. Enormous quantities of shelled corn are used as raw material in the manufacture of alcohol, whisky, glucose, oil, pancake flour, and starch. Corn starch, which is the official starch in the U. S. Pharmacopeia, is used in laundrying, in the manufacture of dextrin, as an article of diet, etc. Ground corn, from which the gluten or proteid matter has been removed, is known as oswego, maizena, or corn flour.

Corn (in the ear or shelled) is one of the staple foods for horses, hogs, cattle and poultry. Corn meal is fed to little chickens, ducks, turkeys and other young of the domestic fowl group. In the treeless western plains maize is often grown for fuel. It is stated that 100 bushels of ears is equal in heating power to one cord of the best hard wood. The cobs form an excellent fuel and are often the only fuel used by the farmers of the central states. Every one has heard of the cob pipe made from a portion of the cob by simply removing the pithy, soft pulp and drilling a lateral hole for the pipe stem. Every farmer lad has made a "corn stalk fiddle" from the stalk. Hunters, in the spring make rude huts out of corn stalks, for protection and to hide them from their game. Corn stalks are used by farmers to form a protective thatching for sides and tops of cattle sheds, etc.

Corn figures extensively in myth and folk lore. The myth of the origin of maize is beautifully told by Longfellow in Hiawatha (V), of which the closing verse is given above. To dream of plucking ears of corn signifies the existence of secret enemies. To find a red ear (a nature freak) is said to signify good luck. Corn stalks scattered about a house in which death has entered are a charm against further misfortune. Ears of corn symbolize plenty.

In the cultivation of corn the farmer of the United States has to contend with various enemies. The army worm (Lucania unipuncta) has destroyed large crops. There is a bacterium described by Burrill of the Illinois Experiment Station which causes a disease of the growing plants, smut (corn smut, a fungus) attacks the developing grain, often being the cause of poisoning cattle who feed upon the diseased corn. The greatest enemy, which is, however, not constant in occurrence, are the chinch bugs which attack large fields of growing corn in enormous numbers. Some years ago the writer discovered the presence of numerous plant lice (aphis) on the roots of young corn plants in Illinois. Rats and mice often prove a nuisance to stored corn. As a rule, however, the corn crop in the central states east of the Mississippi is quite secure, since the soil has been under cultivation for a number of years. Excessive draught and excessive rainfall interfere greatly with the corn crop.

ALBERT SCHNEIDER.

TREASURES

Jade and emerald waters,
  Diamonds of the spray,
Turn to gleaming rubies
  At the close of day.
These become at noontide
  Lapis lazuli;
All these gems we quarry
  From a shining sea.

—ISABELLA HOWE FISKE.

Vol. XIII. MAY, 1903 No. 5.

The beautiful is as useful as the useful.—*Victor Hugo.*

BIRDS AND NATURE

Smithsonian Inst
May 02

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EDITED BY WILLIAM KERR HIGLEY
ILLUSTRATED BY COLOR PHOTOGRAPHY

$1.50 a Year. 15 Cts. a Copy.
A. W. MUMFORD, Publisher
378 Wabash Ave., Chicago, Ill.

Smithsonian Institution

BIRDS AND NATURE

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BIRDS AND NATURE.

ILLUSTRATED BY COLOR PHOTOGRAPHY.

Vol. XIII. MAY, 1903. No. 5

HOMER'S HYMN TO THE EARTH, MOTHER OF ALL.

O universal Mother, who dost keep
From everlasting thy foundations deep,
Eldest of things, Great Earth, I sing of thee!
All shapes that have their dwelling in the sea,
All things that fly, or on the ground divine
Live, move, and there are nourished—these are thine;
These from thy wealth thou dost sustain; from thee
Fair babes are born, and fruits on every tree
Hang ripe and large, revered Divinity!

The life of mortal men beneath thy sway
Is held; thy power both gives and takes away.
Happy are they whom thy mild favors nourish;
All things unstinted round them grow and flourish.
For them endures the life-sustaining field
Its load of harvest, and their cattle yield
Large increase, and their home with wealth is filled.
Such honored dwell in cities fair and free,
The homes of lovely women, prosperously;
Their sons exult in youth's new budding gladness,
And their fresh daughters, free from care or sadness,
With bloom-inwoven dance and happy song,
On the soft flowers the meadow-grass among,
Leap round them sporting; such delights by thee
Are given, rich Power, revered Divinity.

Mother of gods, thou wife of starry Heaven,
Farewell! be thou propitious, and be given
A happy life for this brief melody,
Nor thou nor other songs shall unremembered be.

—Translated by Percy Bysshe Shelley.

THE BUSH-TIT AND ITS NEST.

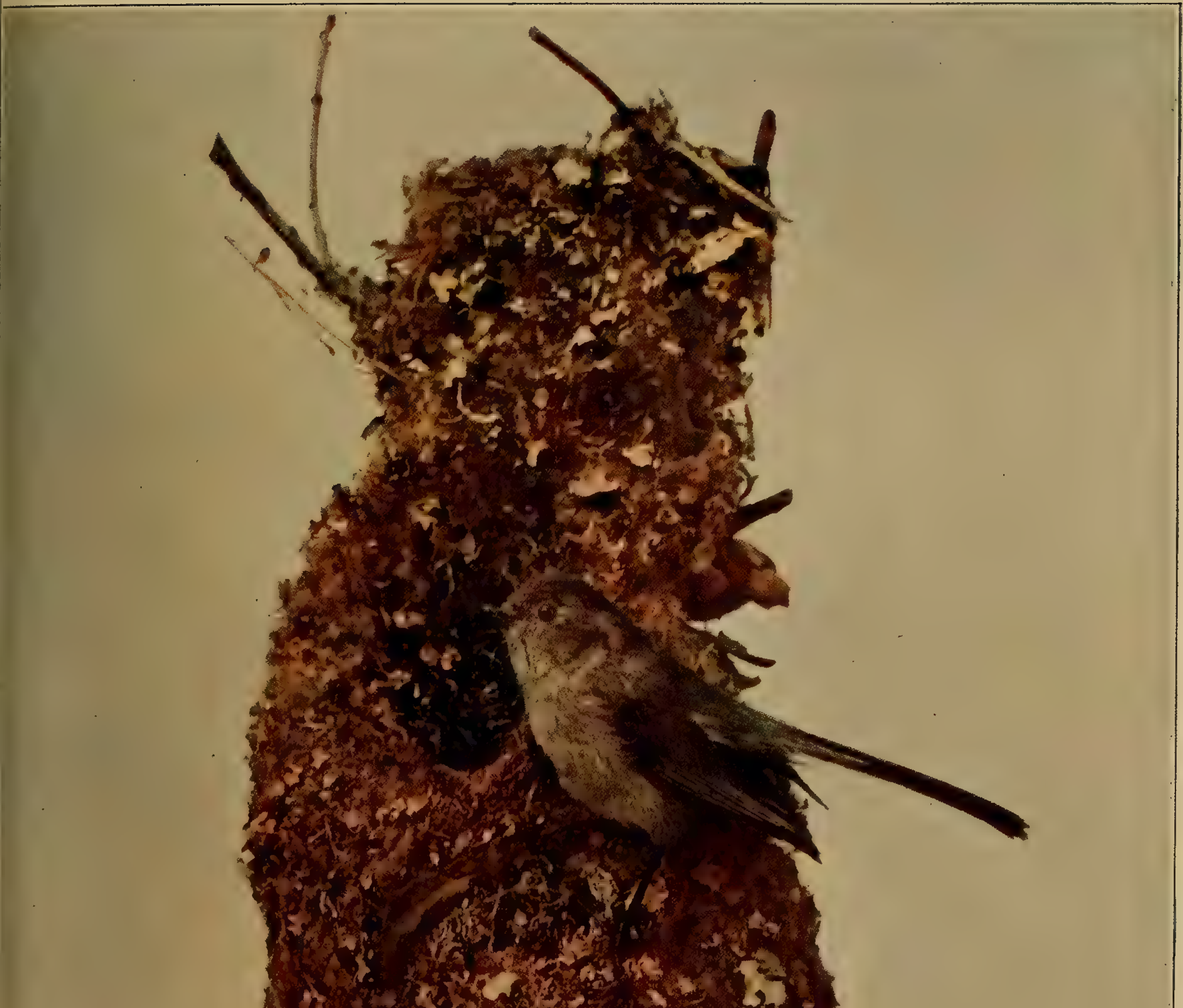
(*Psaltriparus minimus.*)

The Bush-Tit or Least Titmouse belongs to the large bird family, Paridæ. The species of this family are represented by the titmice, nuthatchets and chickadees. In distribution, the family is quite cosmopolitan, and contains several species that are noted for the peculiar and beautiful nests that they build. The majority of the species, however, choose, as a site for their home, holes in trees, or in fence rails and posts, or in the timbers of old buildings. These cavities are neatly and warmly lined with a thick matting of vegetable down, animal hair and feathers. The homes of the true titmice are found in such places.

The Bush-Tits of the Pacific coast of the United States, as well as nearly all the other species of long-tailed titmice, build wonderful nests which are pensil and exceedingly large, when the size of the birds is considered. Minimus, the specific name of the Bush-Tit which we illustrate, is an appropriate name, for the bird is scarcely larger than our common humming bird. In the forests of the Pacific coast, it is an abundant and familiar bird, and its gentle, though active, nature endears it to all observers of bird life. It is said that at times it is so intent in its search for insect food that it is perfectly oblivious to its surroundings and may be easily taken alive. By imitating its call-notes, a number of Bush-Tits may always be attracted to the vicinity of the intruder.

The Bush-Tits are usually seen in small flocks, and the birds, while hunting for insects on the tree foliage, will constantly utter their call-notes. Though it is seldom that two nests are found very near together, yet if one pair is frightened and utters an alarm-note, a number of others will soon appear in the vicinity. If one of a flock is killed, great anxiety is shown by all the rest. They gather around and utter a call that seems almost pathetic, and flying a short distance, while still uttering the call, seem to invite the dead companion to follow. So profound is their anxiety and so earnest is their effort to arouse the dead bird, that the presence of a person is hardly noticed.

The nest of the Bush-Tit is an elaborate affair about eight inches long and three inches in diameter, and in form quite like a long purse. It is suspended from the branches of any tree that suits the fancy of the birds, and is seldom more than five or six feet above the ground. The structure is a woven mass of twigs, moss, bark fibers, leaves and lichens. The entrance is near the top and sheltered by a cover or roof of woven moss and lichens, and also by the foliage of the twigs from which it is suspended. The opening is further strengthened by a strongly woven ring. An observer, describing the interior of a nest, says: "The passageway, at a distance of two inches within the opening, suddenly contracts and its course from being horizontal, descends perpendicularly to the bottom of the nest. The narrow passage below this neck-like contraction, as well as the whole structure itself, again expands, growing larger as it descends, and the lower portion of the nest takes the shape of a cylindrical pouch, three inches in diameter at its greatest enlargement. The length of the passageway is about six inches." It seems almost impossible that two tiny birds can build in a short time such an elaborate and so large a nest. Even the gathering of the materials must require a large amount of labor. It has been suggested by several observers that the nest is not the result of the labor of a single pair of the birds,



FROM COL. CHI. ACAD. SCIENCES

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BUSH-TIT.
(Psaltriparus minimus).
Life-size.

but that the whole flock unite their energies in its construction.

The notes of the Bush-Tit well illustrate the difference between the call-notes and danger signals of some of the smaller birds. Mr. John J. Williams, in an article on "Common and Special Call Notes," published in a recent issue of the "Condor," speaks of the Bush-Tit's notes. He says: "Why these mites of birds should use a warning signal when near human beings, is beyond me, as they are practically unmolested by them at any time, yet such is the case. Here they flit incessantly, in small companies, from one bush to the next over the bush-covered hillsides, passing rapidly along, usually on a straight course, completely absorbed in the search for their minute insect food and uttering a continuous chorus of fine lisping 'tsit it it tsee ee ee.' Frequently I have heard them coming some distance off, and have placed myself in the open, close to their line of travel, in order to observe their actions better. Nearer they come until they are within arm's reach and their call notes still sound as merrily as before. Suddenly one of them recognizes in me something strange and unusual. Not a move have I made, and yet first one and then another gives a warning note, an imperative little "tswit-tswit-tswit," and as if by magic, they pass around me and some little distance away. Not one has flown directly away from me, but for the sake of safety they have changed their course temporarily. In a minute or so their warning notes cease, they feel easier and their cheery little call-notes sound forth again as they resume their original direction through the bushes."

SWEET BALM O' GILEAD.

Swing, swing thy pendant blooms,
Sweet balm o' Gilead!
While the warm airs of the spring
Make the bells and blossoms ring,
Sweet balm o' Gilead!

Breathe, breathe thy odorous breath,
Sweet balm o' Gilead!
While the south wind whispers soft,
"Cold and winter both are lost"—
Sweet balm o' Gilead!

Shake, shake thy glossy leaves,
Sweet balm o' Gilead!
I will be thy lover true—
Skies may frown or skies be blue—
Sweet balm o' Gilead!

—Abby Willis Howes.

BIRDS' HOMES.

The Homes or Nests of birds are almost as different as the houses of men, and all are interesting. But we must take care not to get them until the little families have gone and the nests are left empty.

A chipping sparrow's nest may be known by its fine horse-hair lining. It is neat and compact, and the outer nest—for the lining is really an inside nest—is made of grasses and fine twigs. Sometimes it is in a tree, sometimes in a low bush. The pretty blue indigo bird weaves her cup of grasses, dead leaves and fine bits of bark, also softly lined inside, in the fork of a bush on the edge of a thicket, and I often heard the alarm-note, cheep! cheep! if I went near. Her splendid cousins, the cardinals, build their nests of the same materials, but weave them more loosely together and in a less perfect shape. I found one beautifully placed in the middle of an arch made by some blossoming laurels, overhanging a crystal-clear pool of water.

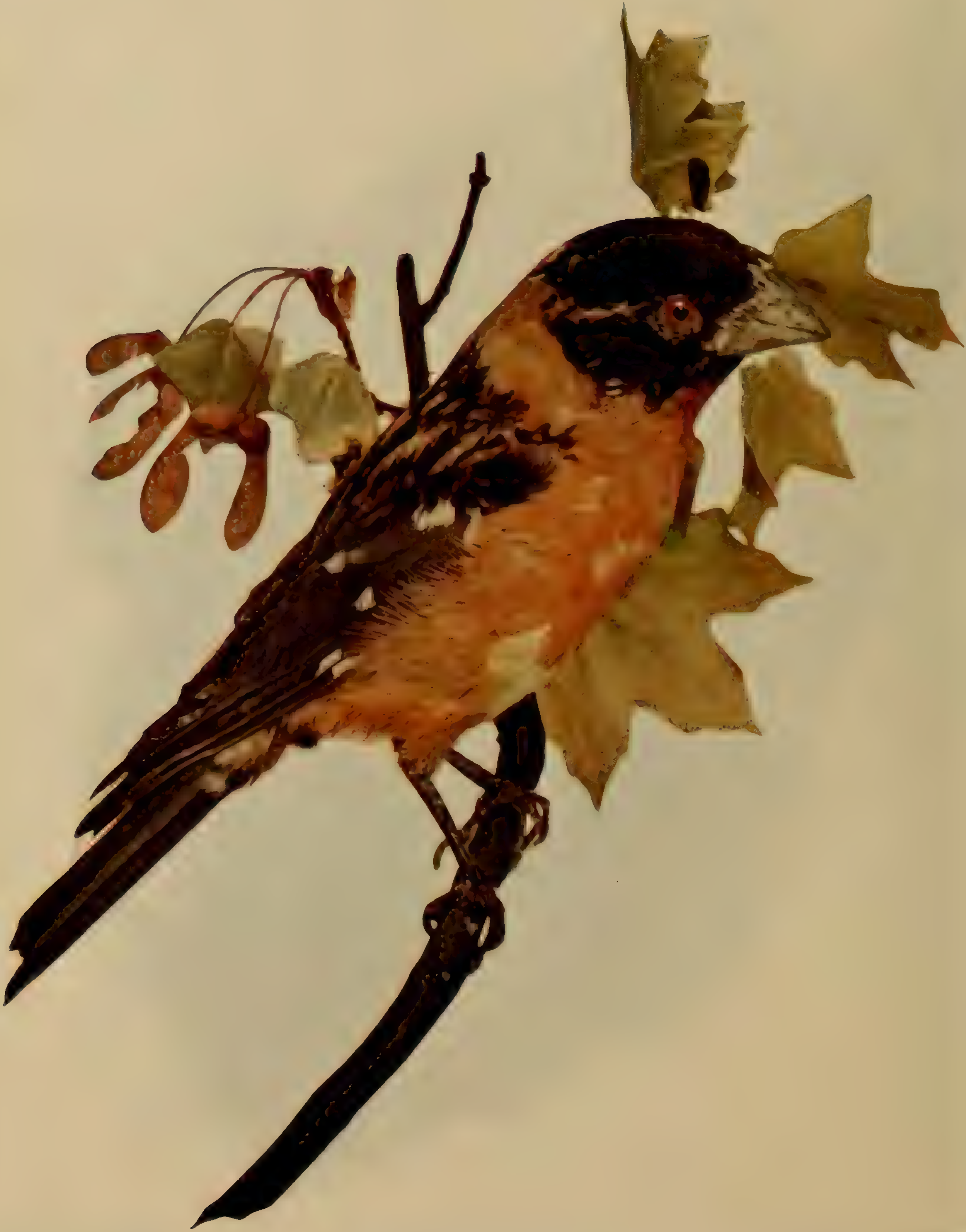
The phoebe is a mason, like the robin, and makes her nest partly of clay, mixed with green moss and lined with grass and hair. It is rather large, and she likes to place it on a shelf of rock or of wood, either a natural ledge or made by man, and also chooses a roof, for it is often found under a bridge or on a rafter. My phoebe's nest was in a stable, and the little ones showed no sign of fear when they were full fledged, for I found this one occupied in the summer time. I did not interfere with the small family.

The oriole's nest is a woven pouch wonderfully made and swung from a high bough. He is deeply interested, but the female bird weaves the nest with her beak for a shuttle, using strings as well as other materials already mentioned. The last nest I examined had the opening a little below the top, which was somewhat covered, and carefully woven loosely in the middle to give the nestlings more air. The orchard oriole's nest is not so long as the Baltimore's, and is supported underneath

A very exquisite nest is the finely woven one of the yellow-breasted vireo, covered all over with a gluey white lace-like looking stuff, either from spider's webs or plant-down. I have seen bits of hornets' nests, paper, etc., in vireos' nests, but all are put together with delicate neatness and are attached firmly to the twigs between which it is placed. The humming bird's nest is a perfect gem, covered with lichens and hardly to be distinguished from a tiny tree-knot. This small bird and the little blue grey gnatcatcher take ten days each to complete their dwellings, the gnatcatcher carefully making the plant-down and other fine material into a thick, close felt with its feet. It is usually placed high above our heads.

Almost every nest is a most interesting result of a bird's individuality, its ingenuity, its resources and its fineness of method. I have only spoken of a very few to be found in any winter ramble.

Ella F. Mosby.



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BLACK-HEADED GROSBEAK.
(Habia melanocephala).
Life-size.

THE BLACK-HEADED GROSBEAK.

(*Habia melanocephala.*)

The Black-headed Grosbeak may be considered the western representative of the rose-breasted species of the eastern United States. Its range extends from British Columbia and Montana, southward into Mexico and Lower California. Throughout the larger portion of this district, it is quite common. "It appears to shun the pine woods, preferring ravines wooded with deciduous trees and upgrown to shrubbery, as well as the thick willow-copses that fringe the mountain streams." On the mountain sides, it seldom ventures higher than eight thousand feet.

In its flight, feeding habits and, in fact, in all its actions, it closely resembles its rose-breasted relative. It does not fly high, and during the breeding season the birds, as a rule, do not associate with each other to any great extent. In the fall, however, they gather in small flocks. Many people say that the rose-breasted grosbeak is the most beautiful singer of all the birds that frequent the eastern States. Of that bird's song Mr. Chapman has said: "There is an exquisite purity in the joyous carol of the Grosbeak; his song tells of all the gladness of a May morning; I have heard few happier strains of bird music." The song of the Black-headed Grosbeak very closely resembles that of the eastern species, except that it lacks some of the variety which is apparent in the latter's sweet-toned voice. The song of both species is often compared to that of the robin. The comparison must stop, however, with the consideration of the musical annotation of the two songs. The Grosbeak's song has "a mellowness about it, and running through it is 'a rich undertone,' which should charm every listener." It is this undertone, this depth of expression, that gives a character to the Grosbeak's song that is not present in that of the robin. One writer has said: "In the coast mountains in May their music is delightful, the males vying with each other from the tops of the trees, and making the hills fairly ring with their melody."

The nests are usually built in low deciduous trees or occasionally in shrubs. They consist of twigs, herbaceaus stems, and bark fibers very loosely woven together and lined with fine roots, grass and hair.

Our illustration is that of the male, whose bearing is always both dignified and attractive. In life, "his body looks graceful as he sits upon his perch, singing his love-song, like a master-bird as well as a master musician."

OUR NEIGHBORS.

Swallows have builded a home in the barn,
Robins nest in the sweet apple tree,
Peewees dwell happily under the porch—
Who has better neighbors than we?

MARY M. CURRIER.

AN INTERESTING LESSON.

Young Master Robin sat on a twig of the maple tree just outside my window. He called in a loud and insistent way to his mother, who sat in the tree some distance above him. It was a baby cry for food, but his mother had evidently decided that he was no longer a baby.

He had no tail to speak of, and looked like a big bunch of feathers, with a beak and speckled breast beginning to grow rusty. "Mother!" he called, "Mother!" No answer. His calls grew more urgent. Mother Robin listened but said nothing. She hopped nearer to him and plainly looked, "I must give this lazy big baby a lesson. He must learn to fly."

She hopped to the twig close beside him. He continued to call as well as he could while holding his mouth open expectantly.

Mother Robin looked at him sadly for a moment and then suddenly flew against him. He toppled off the twig, but discovered that he had wings and flew to a tree near by, his mother keeping close to him as he flew.

On this tree, he sat and called again. His mother felt encouraged, and from the top of a neighboring tree called, "Come! Come!" "Can't," he answered. "Come! Come!" sounded again and again, but the answer was "Can't." At last he grew discouraged and silent, and sat for a long time a very disconsolate bundle of feathers.

Then he began pecking at the leaves about him, Mother Robin still watching from a distance. Presently an air of determination was shown by a change of attitude; he raised his head, looked alertly about him, straightened the humps from his shoulders and suddenly flew some distance out of my sight.

The hard lesson was learned, the victory won. ANNA YARNALL.

THE ROBIN.

"Cheer up, cheer up! Cheery, Cheery!"
So you sing from break of day;
Bringing comfort to the weary
Like a sunbeam's gentle ray,
With its golden gleam of comfort
To a soul tired of the fray.
This is the happy song you sing
When brightly shines the sun in May;
This the song you sing in summer
When the earth is bright and gay;
These the joyous words you utter
When winter cold is on the way!

—W. R. MURPHY.

THE COMING OF SPRING.

It is apparent decided changes are taking place in our outside world.

The ice and snow have vanished, with the exception of a few stray patches here and there which linger in sheltered locations; the high winter winds are becoming less frequent and severe and the clouds are daily growing less somber; the creeks and little brooks are again free from the hand of the frost king and are dashing over their pebbled beds and golden sands; the atmosphere is getting milder and there are warm gentle showers; while now and then we have one or more of those balmy days which make us long to go out into Nature's domain and note what is going on.

The wild geese, moved by that never-failing monitor—natural instinct—are flying northward, and you may chance to see them and hear their "honk, honk" as they pass over your locality. Yes, although the trees are still leafless, and the fields and byways devoid of vegetation, there are unmistakable hints of spring. Has not March brought the blue bird, "the violet of song," and the robin with his heart-warming note, and the meadow lark with his clear joyous greeting, and the song sparrow who bubbles over with joy? Later these are followed by the long list of "season birds," who twice a year wing their way to and from the sunny southland. Their absence during the winter months makes their song the sweeter upon their return and their presence the more appreciated. Those who have come to be on intimate terms with these fascinating creatures have added to the gentle and healthful pleasures of life. No pictures nor descriptions do justice to their grace, their animation, their airy little ways, their skill in nest building and their devotion to their young. There is always another species to look for, another mystery to solve; a new song to record or an old one welcomed back.

From now on there is abundant evidence of new life and activity; the grass is covering the fields with a rich mantle of beautiful green; the early spring flowers which we delight to gather have awakened from their long slumber under the leaves and some of the hardier varieties are already in bloom, heralding the approach of countless others; the maples, too have caught the warming rays of the sun, and are crowned with red and yellow blossoms, and among them is heard the ceaseless hum of myriads of bees. The trees are putting forth their leaves, bursting asunder the velvet sheath which protected them during the past winter. The animals which have been lying dormant through the winter, have aroused themselves from slumber and are coming forth to enjoy the change; butterflies and moths, which have been shut up in their cocoons, now eat their way out of their prison houses and spread their wings to the bright sunshine. Look at the orchards! Where else can you see such an exquisite display of delicate pink and white blossoms; how they harmonize with the tender green foliage, and the air is heavy with their fragrance; see the flocks of beautiful warblers moving up and down, in and out, among the branches in search of insects, chatting to each other in the fullness of their enjoyment. In this way, one by one, our old friends return, and familiar sights are repeated. It is a time of opening and beauty—of the light in the days, of life in the leaves, and of the voices of birds; it is a season which calls our thoughts out and up and away. At what other time can one experience such glorious awakening, such complete renewing of all Nature? As the days go by the early fruits are ripening, the clover is coming into bloom and maturity, and the wheat, corn and other grains are rapidly progressing; all the migratory birds are now in their accustomed haunts in wood, field and meadow, and merry spring, with a quiet, unconscious motion, yet with perceptible changes, verges into summer.

Burton Mercer.

THE OLIVE-BACKED THRUSH.

(*Turdus ustulatus swainsonii.*)

> All the notes of the forest-throng,
> Flute, reed and string, are in his song.
> —Edward R. Sill, "The Thrush."

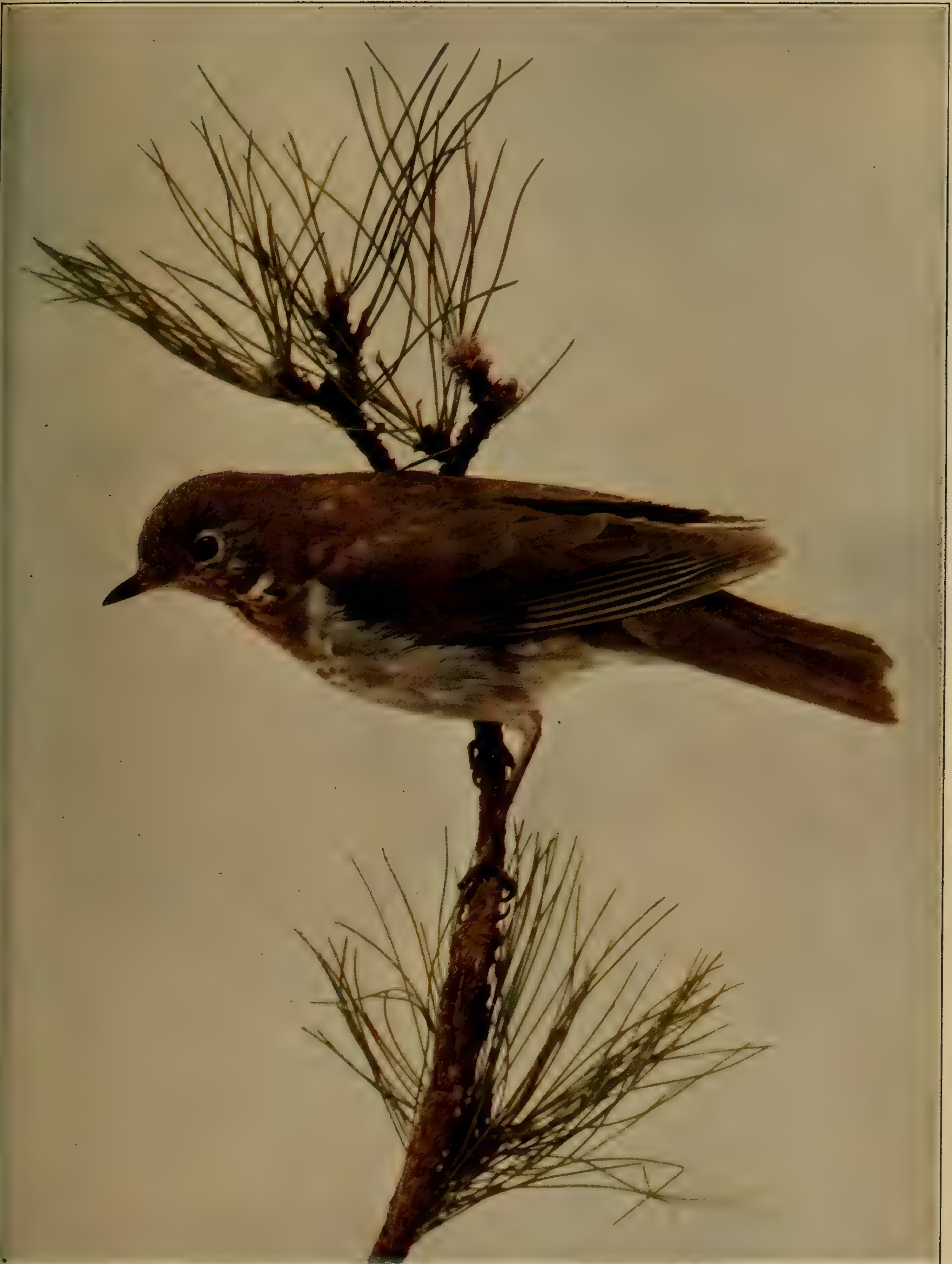
The summer home of the Olive-backed Thrush is in the evergreen forests of the mountainous regions of the northeastern and northwestern portions of the United States, and quite throughout tne British possessions. During its migrations it is more common east of the Rocky Mountains, and as a straggler it is also found on the Pacific coast. Its winter home is in the southern United States, Cuba, Central and South America.

A denizen of the forest and having a shy and retiring disposition, this Thrush spends most of its time in the trees and larger undergrowth. Only during its migrations does it descend to the ground. In the presence of an intruder it will retreat to the higher branches of the trees, where it is hidden by the foliage. When frightened it not infrequently hides behind the limb of a tree, and sometimes it will set perfectly quiet with its back toward the intruder, seemingly trusting to its somber color for protection. It is so shy and retiring in its habits that it is not easily observed and quite usuallv remains unnoticed unless its characteristic notes are heard. "In late September or early October their loud, metallic call-like notes may be recognized overhead at night, and during the day the birds themselves may be found on the edges of the woods or along tangled hedgerows, associated with sparrows and other migrants."

Like the hermit thrush, the Olive-backed species is often called Swamp Robin. Many observers find a strong resemblance both in song and habits between the two species; the chief difference is that the former frequents the underbrush and the latter is more commonly seen among the branches of trees. However, Dr. Bryant observes: "Its notes differ entirely from that of the hermit thrush, and the birds also differ very much in their habits." While the hermit seeks its food low down or on the ground, the Olive-backed will not infrequently launch forth from its perch on a tree top in pursuit of passing insects, which it catches while on the wing with the dexterity of a flycatcher.

To some the song of the Olive-backed Thrush sounds like an inferior rendering of that of the Wood Thrush. "The tones are not nearly so loud, liquid and penetrating." Mr. Langille, who has studied the habits of these thrushes in a locality that both frequent, says: "In this locality the similarity of its song to that of the wood thrush can be well studied, for they both sing very commonly in closely adjoining haunts, and were it not for the greater brilliancy and marvelous expression of sentiment in the performance of the latter, the Olive-back would rank as no mean artist." In its summer home, where, from a commanding position at the very top of some tree, it pours forth its "ringing song," its notes are truly inspiring. In the words of Mr. Dwight, "The effect of its loud and beautiful song is much enhanced by the evening hush in which it is most often heard. It lacks the leisurely sweetness of the hermit thrush's outpourings, nor is there pause; but in a lower key and with greater energy it bubbles on rapidly to a close rather than fading out with the soft melody of its renowned rival."

The neat home of the Olive-backed Thrush consists of coarse grass, leaves, small roots and fibrous shreds of bark, firmlv woven into a solid mass. In the Arctic regions moss is largely used in the walls of the nest. The lining usually consists of fine grass and rootlets and fragments of leaves. The nest is generally placed in bushes or small trees at a height of from five to eight feet from the ground. Wooded banks of streams and lakes are the most favored localities for the nesting of this thrush.



FROM COL. CHI. ACAD. SCIENCES.

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OLIVE-BACKED THRUSH.
(Turdus ustulatus swainsonii).
Nearly Life-size.

Professor Forbes has shown that the Olive-backed Thrush is a useful bird. Examining the stomach of a large number of individuals captured during various seasons, he found that sixty-two per centum of its food consisted of insects and thirty-five per centum of fruits. Nearly three-fourths of the fruit consumed consisted of wild grapes.

THE BUDDING WOODS.

I love the woods—the budding woods,
Where Nature sports her happiest moods;
Where filtered sunshine tints the leaves
With tend'rest hues; where Maytime weaves
With lavish hand and blithesome heart
Bright flower garlands; swift wings dart
Among the trees, and joyous song
Bursts from a myriad throats among
The pillared arches, echoing loud;
While trembling glints of trailing cloud
Above this leafy roof appear,
As dawns the morning of the year
Upon the woods—the budding woods.

SARA ELIZABETH GRAVES.

BLACK BEARD OF THE BIG SWAMP.

Beneath a thick clump of huckleberry bushes, near the Big Swamp in "Indian Wood," one day in the early spring, a wild turkey-hen had made her nest. But so unfrequented was the spot, and so well hidden the rude structure of leaves and straw, that no human eye was likely to behold it; and even then, the turkey had such a way of blending with the surroundings as to appear, save under close inspection, but a blackened stump or a charred pine-knot. As for dogs and other prowling creatures, whose acute smell brooked no deception, she could easily save her speckled treasure by leading them a fruitless chase through the adjoining swamp.

The complaining ye-onk of her pompous mate could be heard from morn till night. And of him, too, as well as of natural foes, she had the nesting-fear; for, enraged at her desertion of him, he would not hesitate to destroy the precious eggs.

Up and down the forest, through bog and brake, along the sheltered edges of the clearings, the gobbler yelped with all his might, and mellowness, of tone; but the hen kept silent.

As the days passed, dangers, not a few, threatened the old hen under the huckleberry bush. Deer-hounds and fox-hounds swept by in clamorous packs; but, by singular good fortune, none touched the exact precious spot. Perhaps, after all, however, this was partly due to the influence of a certain blackberry briar a few feet beyond the nest. (A hound never hunts too fast to dodge a briar.) One night, not long after these incidents, a gray dog-fox came stealing silently as a shadow through the undergrowth. Suddenly he stopped and sniffed; then dashed straight toward the huckleberry bush. His eyes gleamed fiercely in the soft moon-glow; expectancy lurked on the savage droop of his lower jaw. His smell had said "Turkey!" that was enough for him to know.

"Yow-l!" the blackberry briar had torn savagely at his belly, and not in vain. It had served, too, to warn the turkey when the wind was dead against her. With a frightened cry, she sprang off the nest and sought safety in flight. Behind her, maddened to desperation by hunger and disappointment, followed the swift-footed fox. The turkey might have quickly outdistanced him by day, but she ran clumsily at night. Steadily the fox gained upon her. The issue was narrowing itself down to a certainty. If she would only stick to the ground, he would soon win the race, despite the interference of the blackberry briar.

Away up the Big Swamp the turkey led, dodging the trees with the unerring instinct of the wild, leaping the logs, splashing through pools, with as much ease as her pursuer. But nevertheless she was losing ground. The fox realized it, dashing nearer and nearer with great tireless strides.

Several times she could have flown, but having little confidence in her wings, continued to run, saving flight as a last resort. Toward a steep slope at whose base a stream ran sparkling on the moonlight, she turned now with desperate speed. The fox, but a few yards behind, stretched out in all his splendid flight; more than once had the same rate left the hound-pack far in the rear. Only a matter of inches—so near, and yet so far—between the two at last, with the glorious taint strong in the fox's nose. Would the turkey never fly? Her feet were pressing the ledge now. Down that steep slope the fox would win. Already the triumph gleamed in his eye. Suddenly the turkey opened her wings and flopped, and, as she rose, there was a vicious snap in the rear; but the fox got only a mouthful of feathers, and borne onward by his great momentum, rolled over and over till he plunged into the stream below. Dragging himself out, he slunk away, a shabby and shivering figure, leaving the turkey safely perched in a cypress tree.

Returning cautiously to her nest under the huckleberry bush, the turkey continued her task without further interference, and in due time fifteen little turkeys took the place of the eggs. With many a proud peet, peet, the mother led them forth into the Big Swamp, teaching them to observe her own wild ways, adding to their inborn shyness.

One morning, as they were feeding on the edge of the swamp, a swiftly moving shadow fell over them, and in obedience to the mother's warning cry, each one sought to flatten himself out beneath a bush, a bit of brush, or a bunch of straw. But one little fellow found no friendly cover, and the next instant there was a dipping swoop, a faint flutter and a stifled cry, and he was borne off in the talons of a great wide-winged chicken-hawk.

The other little turkeys "played dead" till the mother gave an encouraging pee peet; then they sprang up and followed her into the swamp. They had learned the meaning of the shadow, and the fear of the creature that cast it was strong upon them. Thereafter, even when a flock of crows or doves passed overhead, they fell swiftly under cover. But among the wild wariness is the gift of both friend and foe alike; so the turkey-flock continued to suffer till only seven were left.

Among these was a plump little gobbler, that had only excelled the others in imitating the mother. He always kept an eye to danger. No matter how tempting the food, he constantly raised his head to see if the coast was clear. Others might forget themselves to gather up greedy mouthfuls, but not he. Though absolute silence reigned in the Big Swamp, he was still wary; he took nothing for granted. The most innocent-looking objects might prove to be enemies; he tried everything by the double test of sight and smell. At nightfall, when the flock went to roost in the Big Swamp, he always chose the highest limbs of the cypress tree. His wisdom was justified one night when a little hen foolishly roosted on the ground and fell prey to a prowling fox.

A few days afterwards, as they were wandering around in the Big Swamp, a distant ye-onk quavered plaintively through the air. The hen answered it and in a few moments her former mate, a huge pompous red-wattled fellow, came strutting through the undergrowth. He greeted her gladly, but showed little affection for his children, giving the wise young gobbler a cruel pinch by way of salutation, or as a rebuke for his superior wisdom. After that, the old gobbler seemed to have a special grudge against the young one, taking pains to prod him on all occasions with his strong sharp bill. The young gobbler would have left the flock, but the Big Swamp seemed too lonely; and, besides, his mother and former nestmates urged him to remain, showing him many little attentions on the sly.

Summer passed and autumn, with its dreary leaf-fall, came. The constant thud of overripe nuts and acorns resounded in the forest. The turkey-flock scratched industriously in the fallen leaves; but, after the squirrels above, and the swine below, had winnowed it, the acorn-crop was scant. Then the old gobbler led out to the neighboring fields where an easier, though more perilous, living was to be obtained by by shelling the ripened peas and stripping the fallen ears of corn. Here the young gobbler, that we shall call Black Beard —as he was called later,—became more watchful than ever. Somehow he knew that these were stolen sweets. For many days the turkeys frequented the fields without serious results; though two or three times they had been frightened off by farm-hands. Some of the flock—even the old gobbler—came to regard the open more favorably. Black Beard, however, was not among the number. He saw danger—perhaps death—looking down those long corn-rows. But not until one morning when the old gobbler, flurried and fairly peppered with squirrel-shot, dropped into the Big Swamp and rose to his feet on the run, was Black Beard's caution heeded.

When at last winter reigned in "Indian Woods," spreading its soft white mantle of snow even over the moist tussocks in the swamp, the turkeys met many hardships. Food was difficult to find; and then but a few sour winter-berries rewarded the effort. The flock ranged far and wide, but always along the trail of the Big Swamp, straggling by day through the sheltered fastnesses, shivering at night upon the naked limbs. Unable to withstand the severity of the weather, several of the weaker ones drooped and died, remaining, for a time, somber dark spots upon the driven snow. Black Beard, strong and swift as of yore, kept pace with the old gobbler, and together, quarreling and disagreeable, they led the way. They came one evening on a little path cleared through the snow. Along it for many yards lay scattered grain. Black Beard viewed it with suspicion and distrust, but the other, emboldened by hunger, leaped into the trail and followed it greedily on and on. Behind them, still watchful and wary, came Black Beard gleaning what was left. Suddenly he saw two dark objects protruding from a strange-looking brush-pile in the distance; then his keen ear caught a slight noise. With a quick turn, he gave the warning cry, but, before the others could run or rise in flight, there were two deafening reports and Black Beard, scurrying away into the swamp, knew that evil had befallen the flock. Hours later, when the gold of sunset was glinting the ermine hills, he sent forth a soft inquisitive yelp, and, one by one, the stragglers gathered to his call—save his mother and old gobbler; they never returned.

Finally, the snow all melted and food became easier to obtain. The change was soon manifest in the flock, for each one took on better flesh. Black Beard guarded and guided them with a master's skill. He was a fine young turkey now, wonderfully large for his age; black and glossy, with a touch of green about the neck; red-wattled and lordly. A growing tuft of coarse black hair on his breast was beginning to justify his future title—Black Beard. He never ceased to teach his followers to be wary; but alas; he could not know that the strongest of all foes was plotting their destruction, and that he seldom plotted in vain.

It happened one drizzly day, as Black Beard was leading them through a pine ticket, that a bird-dog suddenly appeared in the distance. Black Beard saw him in a flash and quickly warned the others, but at sight of the dog a strange madness seized them and they flew up into the pines to watch him, while the gobbler sped on his way. Once Black Beard turned and called fractically, but they only sat there, staring stupidly down at the setter winding along the trail below. A few moments later there was a loud roar of guns, and a solitary hen, leaping over her slain companions, ran wildly toward the Big Swamp. The spell was broken, and so was her right wing, leaving a trail of blood along the ground. At nightfall she responded to the gobbler's yelp, and wearily dragged her broken wing to where he stood watchfully in a cluster of reeds. Seeing that she could not fly, he roosted beside her on a log that night, facing the numerous perils of the nether forest. This he continued to do till the inflammation from the wound had ended her unhappy life.

Then he wandered forth, alone and mateless—an outlaw in the Big Swamp. The territory from "Ten Mile Tract" to "Six Runs Ford" became his range. Men hunted him remorsely, but fruitlessly as well; a kindly fate lay about his life. Often he could be seen speeding softly like a black thing of night through the thicket, or sailing gloriously over the pines and cypress trees in the Big Swamp—always out of reach. He could not be tempted to approach a "blind" (the experience during the great snow was well remembered); the best "turkey-callers" always failed to elicit his response. Once only he answered them; then with mischievous mockery quavering in his well-sounded tones.

Two whole years he spent thus. Along the Big Swamp he came to be known as Black Beard, not only for the long tuft that now swept proudly over his breast, but for craft and cunning; and his piracy in the open fields—piracy accomplished at times when men least expected it.

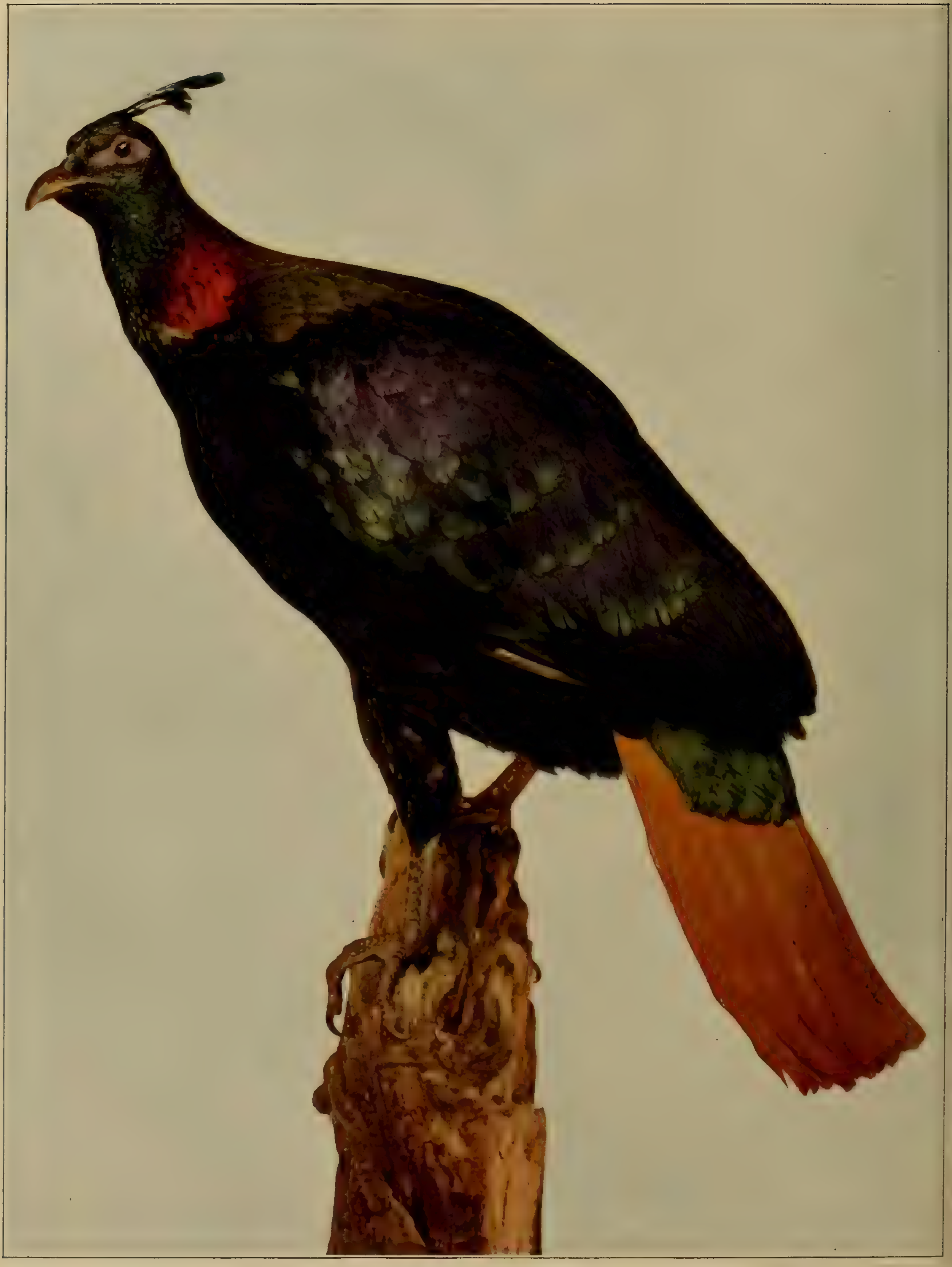
The farmers of the Big Swamp section employed their spare time, and rainy days, in hunting Black Beard, apparently, to his delight. It was no unusual thing for him to appear now and then, as if by magic, before them, only to lead them bewildering chases through the swamp; then disappear with a farewell gobble over the tops of the trees.

More than one sportsman, too, had counted on the big turkey for a Thanksgiving dinner only to dine on the spare bone of a vain regret.

A party of 'possum hunters passed along the Big Swamp one night not long before Christmas. There had been no rain for some weeks, and the swamp was remarkably dry for that period of the year. No one ever knew just how it happened, but in some way fire got out, and aided by a rising wind, swept on with the fury of demons, leaving in its wake a broad blackened waste. The wild things of the swamp hemmed in on all sides were driven within an inclosure a mile in length and a quarter of a mile in breadth. (This was where the stream ran deepest and broadest over the bed of a former mill pond.) Thither, long before the dawn, gathered hunters from far and wide. Armed with all kinds of guns and accompanied by numerous nondescript dogs, they surrounded the asylum of the wild. Then the fatal drive commenced. Rabbits and foxes, 'coons and 'possums dashed forth, but they were given little heed. Every eye watched for Black Beard and every gun was loaded with turkey-shot, save now and then one in the hands of an inveterate deer-hunter. For hours the drive continued, the circle growing smaller and smaller. Yet the old turkey had not appeared. Had he outwitted them, after all? Had he flown that red gauntlet of fire and sought other woods? No; it could not be.

Suddenly there was a shout and every eye was strained, every gun uplifted in eager hands. Then grandly, as he had done in the olden days, Black Beard rose up, up—and for a moment the morning sunlight flashed on his glossy coat; then a scattering volley flamed forth and he circled and fell back—to the soil he had loved—kingly and splendid even to the end.

John Jordan Douglass.



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IMPEYAN PHEASANT.
(Lophophorus impeyanus)
$\frac{2}{5}$ Life-size.

THE IMPEYAN PHEASANT.

(*Lophophorus impeyanus.*)

This beautiful bird which is noted for the wonderful color and metallic iridescence of the male's plumage, is a native of the higher and colder regions of India. It is greatly admired by the natives of India, who have given it the name Monal or the bird of gold. The metallic luster of its plumage is so very marked that some authorities have been led to give this bird the specific name resplendens. The plumage of the males of nearly all the pheasants is quite as strikingly brilliant, while that of the female is much more somber.

Writing of this pheasant as it is found in its forest home in the Himalayas, Mr. Wilson says: "The Monal is found on almost every hill of any elevation, from the first great ridge above the plains to the limits of forest, and in the interior, it is the most abundant of our game birds." And another enthusiastic observer writes: "There are few sights more striking where birds are concerned, than that of a grand old cock shooting out horizontally from the hillside just below one, glittering and flashing in the golden sunlight, a gigantic rainbow-tinted gem, and then dropping stone-like, with closed wings into the abyss below."

When the severe weather of winter sets in, the pheasants descend into the forests of lower altitudes where the ground is covered with a thick layer of decaying leaves. Here they find an ample supply of insect food. Though a few of the older birds remain in higher altitudes throughout the winter, the majority descend to lower levels, and in the spring again ascend the mountain sides, as the snow and frost disappear.

"The call of the Monal is a loud, plaintive whistle, which is often heard in the forest at daybreak or toward evening, and occasionally at all hours of the day." It is an omnivorous feeder, its food consisting of grains and other seeds, insects, fleshy roots and succulent herbage. The length of its wings, which are very short for the size and weight of the bird, shows the Impeyan Pheasant to possess terrestrial habits. Its flights, though quite rapid, are short, and taken, as a rule, only when frightened.

The Impeyan Pheasant does not seem to bear a change of climate. Many attempts to domesticate them have been made in several countries. Lady Impey was the first person who carried them alive into Europe and there made an unsuccessful attempt to naturalize them. It was in recognition of her efforts, that this Pheasant was given both its specific and its common names. The bird of our illustration died near the city of Chicago, while in captivity with a number of related forms.

The Impeyan is not the only pheasant inhabiting that wonderful country which is noted alike for its beautiful birds, its beautiful flowers and for its ferocious animals. India also claims the magnificent tragopans or horned pheasants, of which there are four or five species. The males possess two fleshy growths which lie, concealed by feathers, on the crown above the eyes. When these growths are erected, they resemble two blue horns projecting from the top of the head.

The charms of all these fascinating birds are only fully exhibited during the breeding season. Words cannot express the beauty of their "nuptial dances" when they show to the female the resplendent metallic coloring of their plumage, which varies in tint with every motion of their bodies, and with the ruffling of their feathers.

A GOSSIP ABOUT MY NEIGHBORS.

"What, peeping and spying on your neighbors to make copy? Think shame to yoursel'!" say you disgustedly.

"Yes, and sometimes even using an opera glass," say I boldly.

Then you sit down in my little opera box in the back veranda, curtained in by the trumpet-creeper, and you look about. In front, the sloping lawn with the pear trees and evergreens, the pond with the willow trees, the orchard, the creek and the mountains. At the right, the big apple tree near the kitchen door, the poppies and corn-flowers in a big mass, separated from the vegetable garden by a hedge of sweet-peas; the maple grove and the stone wall. At the left, the lawn, the driveway through the lindens and maples, the tennis court and the meadow.

"Oh, I see, it is all a joke; you have no neighbors," say you.

"Indeed, it is no joke, for I have fifty neighbors whom I can watch from this very green wicker chair," say I. "I have watched the building of many homes. I have been an uninvited guest at weddings and christenings. I have been an unappreciated mourner over desecrated and deserted homes. I have peeped and listened at love-makings both timid and bold. I know a beggar, I know a thief, I know a murderer, I know a faithless wife. Look! there comes a bold and shiftless beggar."

"Oh, birds!" say you with a yawn, as I fling some crumbs to the beggar.

"This optimistic and shameless beggar is the mother of three optimistic and shameless little mendicants like herself. Just watch a moment."

The beggar gives a call, and down come her three, alighting in open greediness on the very steps of my veranda. There they sit in a row like Sunday-school scholars, while the devoted mother drops my crumbs into their cavernous mouths; I, the easiest of victims, continuing the crumbs until they are satisfied, and logy.

"How pretty!" say you.

"Pretty!" say I. "The whole proceeding is a disgrace to them and to me. Instead of eating my bread, they should be digging good wholesome worms for themselves. My garden paths are lost in weeds, and here I sit and weakly fling crumbs—thus ruining their careers and my garden. Pretty indeed—shoo!" and away they go.

"Look!" say I, nodding toward the flecks of flame that make my poppy-bed, "the gay beauties!" Five, six, little yellow goldfinches in black caps are tilting and swaying among the poppies and cornflowers.

"What are those dull green birds playing with them?" say you, ignorant, as are all the industrious.

"Their wives," say I. "Hark to those yellow warblers, warbling to split their throats, in the willow tree. See the kingfisher, poised on top of the fir tree across the pond, watching his dinner as it swims about in the sunlight. Say your prayers, little fish, Mr. Kingfisher has numbered your seconds."

Over there in the orchard I see Mr. Flicker enjoying a meal which carries consternation to a whole ant colony. Little does he care. I saved the life of one of his babies up there in the dead branches of that cherry tree, and he never even gave me a civil "thank you" for it.

"See, the Purple Finch has come to visit his cousins in the poppy field; and do look at the Vesper Sparrows and the Englishmen and the Robins all bathing together in the corner of the pond! There is a fight going on in the hemlock tree, but never mind that. The noise that sounds like a squeaky lawn-mower is only the Chippy family quarreling over luncheon.

Cats? No, I do not keep them. That is Mrs. Cat-Bird in the trumpet-vine above your head. They have been in hard luck. They settled first in the syringa bush near the pond. Just as the pretty blue-green eggs were nicely laid, everybody came to pick syringas. Every time a syringa was picked, over toppled the nest. Day after day I righted it. I threatened and scolded and stood guard with a club. But at last the eggs lay broken on the ground. Mrs. Cat-Bird concluded that syringas had suddenly been made the National flower, so she moved to the trumpet-vine.

Down in that clump of trees where the meadow narrows to a point and the brook runs into the creek, there is an interesting settlement. Listen! Do you hear that hysterical rapture going on down there, like a continuous performance, That is Mr. Spotty Perky Wren. He is likely to burst with joy at any moment; joy, because of the earth and the fullness thereof; joy, because Mr. S. P. Wren was clever enough to put his front door on the underside of the hollow limb of the elm tree, where the busy world would never spy it (he forgot that I was never busy in my life); joy, because inside that dead and stupid-looking limb are five tiny perky baby wrens whom he considers unnaturally beautiful, and living images of their father—every one. Notice that bit of lichen pasted on the branch of the oak tree. Mrs. Humming-Bird calls that a nest, and she fondly believes that from those homeopathic pills on which she sits day after day will one day come youthful Humming-Birds. Papa Hummer sits careless and debonair two or three trees away, posing as the heartless husband, and deceiving nobody. That little growth in the crotch of the maple is the home of a white-eyed Vireo. And over in that same corner near the creek, where the trees and underbrush make a plunge at the end of the meadow, live the Wood Thrush, the Oven Bird, the Hermit and the Water Wagtail. And when night is beginning to come and you have a lonesome feeling at your heart, the Wood Thrush calls his love: 'Em-o-lee, Em-o-lee." It comes through the still gray dusk like a prayer, and if I were Emilie I should go—even to the jungle.

No, that is not a knock at the kitchen door; it is the Downy Woodpecker in the ailanthus tree. But what is this hullabaloo over by the rose bush? I hear strange voices. Not a Cuckoo—the shyest of the shy! Oh, no, that would be too great a thing even to dream of. But yes it is!—there can be no mistaking that motion—that note—those tail-markings. Mr. and Mrs. Cuckoo at my door! What can it mean? Ah, I see; the baby cuckoo is caught in my rose-bed. Was ever an idler so blessed?"

"I must be going," say you who never studied idling.

"Good-bye," say I. "Please go softly, and on the far side of the rose-bed. I cannot weed my garden today; a baby cuckoo is in my rose-bed."

NELL KIMBERLY McELHONE.

THE BLUEBIRD.

Love wrote a poem on the blue-bell's cup,
  A tender dream of unforgotten springs,
And when the grateful flower to Heaven looked up,
  Translating the sweet poem word by word,
Delighted with Love's work, the Master heard
  And gave the little blossom two blue wings.

NELLY HART WOODWORTH.

HABITS OF THE AMERICAN CROW.

(*Corvus americanus.*)

The family Corvidæ is composed of crows and jays. They inhabit all portions of the globe, except New Zealand. In the United States we find the American Crow to be the most abundant representative, and barring the sparrow and the robin, the Crow is undoubtedly the most familiar in name of any American bird. On this continent their range extends from northern Mexico to the Arctic regions, where they are then replaced by their larger relative, the raven. The American Crows, which breed from northern United States and northward, usually migrate at the beginning of cold weather. In all other localities, however, they are generally residents throughout the year, from the Atlantic to the Pacific. The Florida, fish and northwest crows inhabit the extreme portions of North America and are all closely allied to our common Crow, the principal differences being in the size of the bill, feet and wings. A typical American Crow is entirely black with a metallic luster which is suggestive of purple or steel blue.

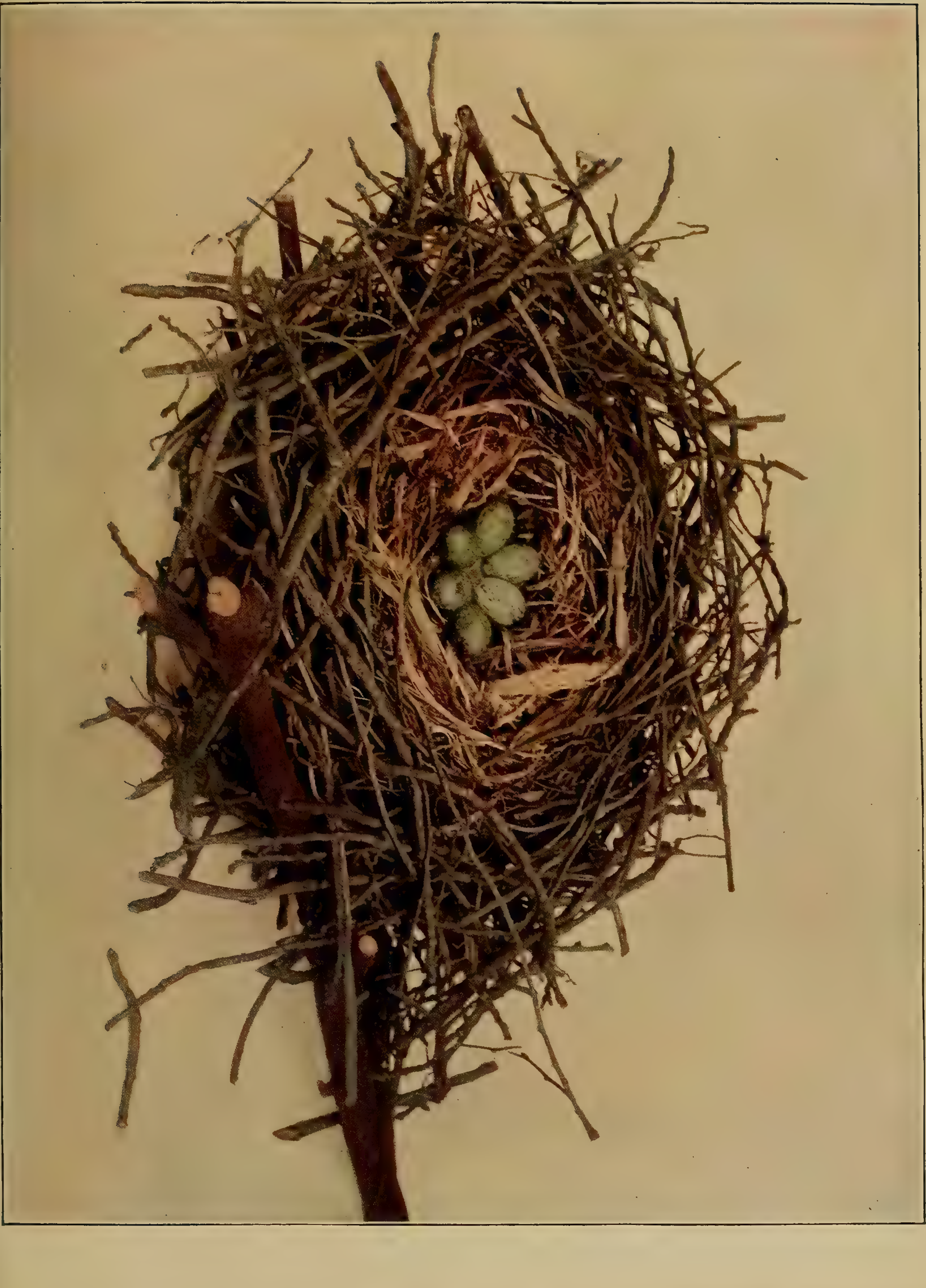
Both sexes vary considerably in size, but the female averages smaller than her mate. Regarding diet, Crows adapt themselves to most anything; in fact, his bill of fare is as varied as are his call notes. Fruits, seeds, grain, insects, crawfish, carrion, eggs and young birds are all agreeable to a Crow's palate.

They are very intelligent creatures, possessing a vocabulary with such a diversity, in the number and tone of their notes, that naturalists have termed it a "Crow language." Cunning, mischievousness, inquisitiveness and daring are characteristic traits of the Crow, and therefore his reputation among other birds (also the farmer) is far from enviable. Although few are their friends and numerous their enemies, the Crows appear to be very loyal to each other, and I know of no other bird (aside from the English sparrow) more capable of holding his own against all intruders.

Less than seventy years ago the Indian, wolf, prairie chicken and wild-fowl, together with the Crow, were the most prominent features of the Calumet region, in and about where Chicago is now located. With the encroachment of civilization all have vanished, save the Crow, which continues to nest in considerable numbers, annually, within the city limits of Chicago. From October to April they congregate at dusk by the hundreds about some favorite roosting place, and at early morn they scatter about the country, apparently in search of adventure as well as of food. The nesting season extends from March to June, according to locality.

In the Great Lake region eggs are deposited in April, but in the vicinity of Chicago the birds are rather early this year. I observed a nest containing six eggs on the 29th of March. Nests are placed from twenty-five to seventy feet above the ground, preferably in the crotch of a forest tree. In Dakota, where timber was scarce during the latter part of May, 1900, I found them nesting only ten feet above the fround. Recently I have located several nests about Chicago which were only fifteen feet above the ground, while other pairs continue housekeeping at an elevation of sixty feet.

The nests are constructed of twigs, hay, roots, grass and sod, with a lining of finer material consisting of bark strips and bunches of hair and wool. They are on the whole very bulky affairs, although quite substantially built. Last year's nests are a favorite receptacle for the eggs of the horned and barred owls, which utilize them for breeding purposes during February and March. The eggs in a Crow's nest average four to seven in number and exhibit great variation in size, shape and coloring. Eggs from the same nest frequently appear to have been



FROM COL. CHI. ACAD. SCIENCES.

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laid by different birds, so varied are they in appearance. Some eggs are light blue or green and almost immaculate; others are heavily spotted, speckled or blotched with different shades of brown and olive, and often the markings are so dense as to almost conceal the background. The specimens vary in shape, from extremely long and narrow ones, to eggs that are nearly equal in width and breadth.

A large series of Crows' eggs in my collection shows remarkable contrasts in size; ranging from one and fifty-eight hundredths to one and seventy-three hundredths inches long, by one and fifteen to one and twenty-two hundredths inches wide.

GERARD ALAN ABBOTT.

THE CHICADEE'S SPRING SONG—"PHOEBE."

What mean you, Lady Chicadee,
Changing your name capriciously?
When your true lover calls today
He does not call in the old way.
Hark! hear him now: "Phoebe! Phoebe!"

Perhaps you like that name the best,
And will not answer save when he,
With throbbing throat and swelling breast,
Calls you, and oh! so lovingly!
By your new name, "Phoebe! Phoebe!"

At least I saw you come today,
You darling Lady Chicadee,
When from the tree-bole, plaintively
Rose that enticing melody,
So tender-sweet, "Phoebe! Phoebe!"

What yearning in that simple call,
Clear as an angel's song might be,
And yet not all a joy, not all,
As if he knew that love must be
Partly a pain, poor Chicadee!

O yes! I surely saw you drop,
Shoot downward from the maple tree,
And stand beside him e'er he stopped
(Yon coy young-lady Chicadee),
Calling your name, "Phoebe! Phoebe!"

Nay! never think I meant to chide
Because you answered speedily,
You precious little black-capped bride!
I should have gone had he called me
In that persuasive way, Phoebe.

—NELLY HART WOODWORTH.

BIRD NOTES IN NEBRASKA.

April 25.—Saw two flickers (yellowhammers) hobnobbing with each other on a telegraph pole. It was very funny to see them stretch their necks to peek at each other around the pole. Once I saw two of them play hide and seek on the sides of a post, while a third one sat on the top of the post and acted as a sort of umpire of the game. At another time I saw two chasing each other round and round, up and down, the trunk of an apple tree. At the same time several of them danced a sort of minuet on the ground. I watched one for some time on a telegraph pole as it beat its tattoo call with its bill. After making the noise it would stretch its neck and look this way and that to see if its mate was coming in response to its call.

At that same place a pair of flickers had made a nest inside the outer sheathing of an engine house built close to the railroad. They had dug a hole through the board. One of them would fly and crawl into the hole, and in an instant it would turn round and protrude its head to watch the man who was watching it.

April 26.—Saw a flock of thirty or forty Bohemian waxwings, the first I had ever noticed. I may have seen them before, possibly back in those days when "in seeing I did not perceive." How clean the waxwings are, how well groomed, how quiet, how polite to each other, and how well they mind their own business! Other birds do not disturb them much, perhaps because they travel in flocks. I fell in love with the waxwings. I wish I could see them more frequently.

May 23.—Early in the morning I saw a strange bird on a windmill. It was going through some strange vocal performances. I followed it around for several blocks trying to identify it. It kept some distance from me. I wondered if it was a brown thrasher. Just then—what a coincidence—a brown thrasher lit upon the telegraph wire so near the other bird that both were in the field of vision of my glass, so that I could compare them. The strange bird was a mocking bird, the first I had seen, or perceived. What a funny habit it has, just before it alights, and while still singing, of flying several feet straight up in the air and pausing there a few seconds before settling down on the perch!

What a magnificent bird the blue-jay is, when he keeps his mouth shut! And what an aristocratic scold he is at times! He delights the eye, but not the ear. He must be a great favorite with deaf people. It is amusing to see blue jays hopping, almost gliding, like the cat bird, through the limbs of a tree. About the middle of May last year there was one, perhaps different ones, that lit many times on the parsonage windows and tapped loudly on the glass, in woodpecker fashion. The noise was a startling one. Was it calling for food? Or did it see its reflection in the glass? Can any one explain the action? Perhaps he wanted the dominie to tie a knot for him. One day three of them, two males and a female, were performing on the ridge of the steep church roof. As they stood in a row the female would edge away from the males. Then the male farthest off would hop over the other so as to get next the female. Then the other would hop over him. And so they kept hopping over each other until they had traveled the length of the ridge. The next hop would be off the church entirely, and then they all flew into a tree.

ROSELLE THEODORE CROSS.

BIRD NOTES FROM NEW YORK.

There are signs of spring to the watchful eye through every month of winter. The willows never lose their tints of life entirely, and I have known the catkins to be in blossom from November to March, when they are generally first expected, but of all the assurances of life amid the apparent herds of death, none is so true as the song of the winter birds.

Putting the boldest first, there is the blue-jay, his bright feathers seeming to uplift the sky above and his loud cry cutting through the clear air. One forgets the not always praiseworthy behavior of this bird in gratitude for the flash of color through the trees. Then there are the crows, the juncos, the woodpeckers, the chickadees and the rarer species of pine warblers, waxwings and snow buntings.

The flicker is a winter bird, but I have always associated him with the spring after reading Thoreau's description of him as the alarm clock of nature. "Up, up, up, up, up," he cries to awake the outdoor world.

To the majority of people, however, the first note of spring is, and always will be, the call of the bluebird. His voice touches the heart, as well as the ear, and he remains the herald of the coming year.

Mr. Burroughs writes of the excitement and delight which greet the news "The robins are here." Indeed it is one of the events of our lives. The great newspapers opening their columns to the news of the world announce some morning that "robins have been seen in Central Park," and their no less aggressive country neighbors declare the same good tidings of a more wild and distant landscape.

Birds, like men, have their leaders, but if the blackbirds, the song-sparrows, the purple finches, the phoebes and pewees do not cause such a stir in birddom they certainly have each an individual welcome. One of these, especially, the song-sparrow, holds a tender spot in our hearts. Far back in the February snows his song rang out sweet and clear, as it would in summer days, and it is still unchanged when the woods, almost bare, are again preparing for winter.

These three, the bluebird, the song-sparrow and the robins (somehow it is not natural to speak of these sociable birds in the singular number), arriving at about the same time, seem, each in his own bird temperament, to reflect a trail of the approaching season of spring.

The bluebird brings us its elusive quality, the ephemeral brightness which fills the earth, the half-pensive, poetic faculty. To the song-sparrow belong the child-like happiness of spring, the glad ringing melody, and the robin partakes of the restless, cheerful element, househunting, singing, everflowing with the joy of the moment.

After these first arrivals the coming of the birds is a daily, almost hourly, event.

In the April days the air is full of slender threads of melody, which, as the weeks go by, swell with harmony and rapture, until the bird chorus reaches its height the middle of May. The last half of May and the first two weeks of June correspond to the opera season between Christmas and Easter. The music almost overwhelms one as the myriad voices in woods, fields and along the roadside, in the garden and around the house, fill the days with beauty of sound.

Here, again, another trio make themselves known above a host of others—the oriole, the catbird and the thrush.

The first, with his flaming colors, a bright note among the trees, visible, hearable from all around. The second hearable because he cannot help it (and who wishes he could?) and visible because he will not help it, and the third, one always wishes to speak of him with hushed voice, the thrush, head of the throng of songsters, making his music "indefinitely far or near, a little more distant and unseen as great poets are."

Following close to those leading, dominant spirits come the crowds of warblers, the cuckoos, the goldfinches—time fails me to speak of them all, but let him who wishes to know go himself and watch and wait for them with due patience. And they will come to him, and he will love them during the mad chorus at daybreak and the silence of noonday, and in the plaintive music of the twilight hour.

LEONORA SILL ASHTON.

RIVER MUD AT LAS VEGAS, NEW MEXICO.

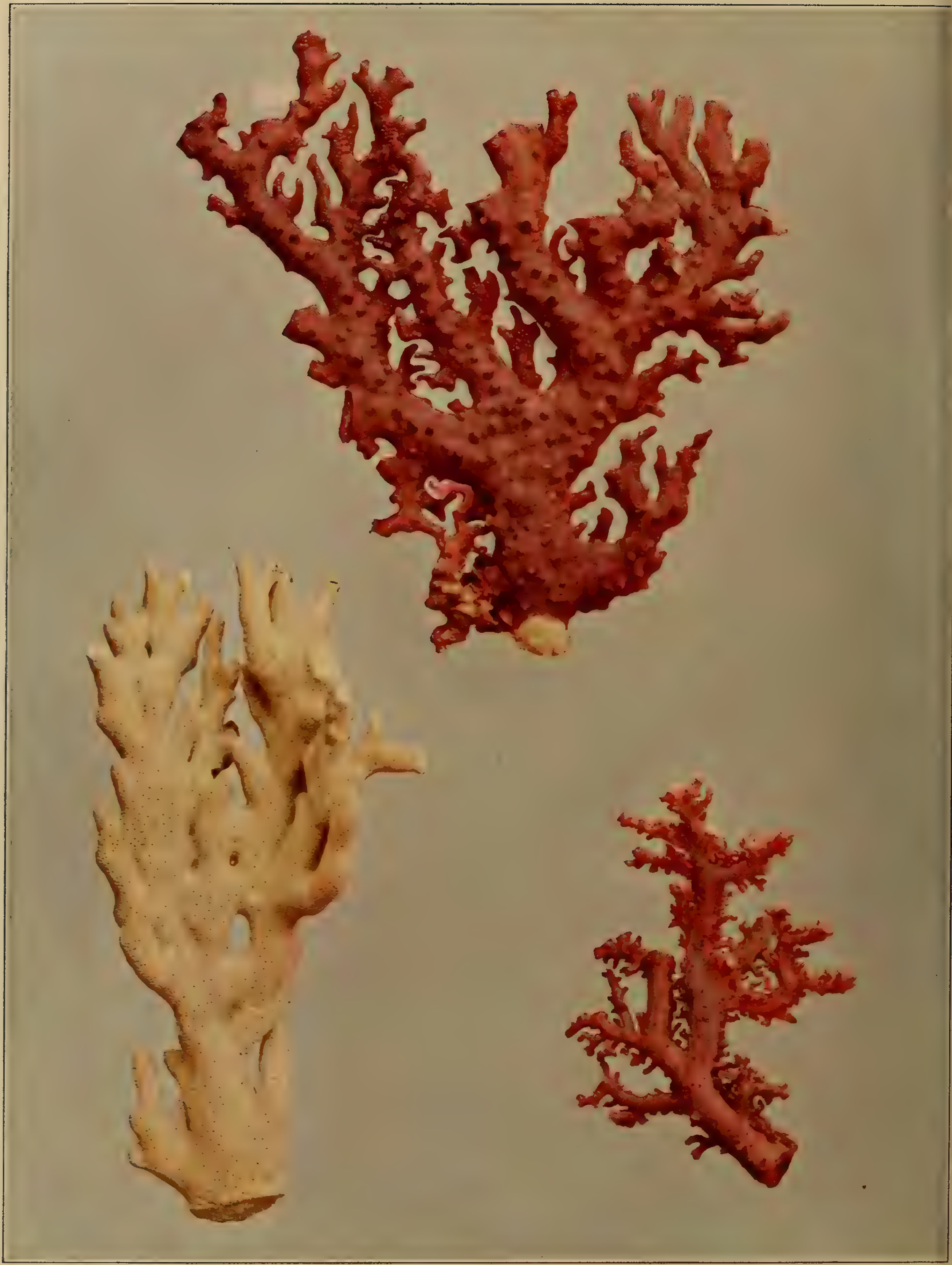
The mud from the rivers usually has a brown shiny coating; on the rocks this gelatinous substance is sometimes more than an inch thick, often, indeed, it floats in long strings or spherical masses resembling somewhat the bladderweed so common in the ocean. Under the microscope we see that this unattractive mass is in reality very beautiful—made up of thousands of gondolas or tiny boatlike plants called diatoms.

In the river here I have grown familiar with a dozen species, and I doubt not that by study many more would be found. Some of these diatoms are firmly attached to a support and do not move, but others steer themselves about with great precision. The cell covering of these tiny plants is hardened and resembles a transparent shell: it is marked with bands, ribs and curious sculptured patterns just as you have seen shells marked. A very interesting question arises when we try to discover how these one-celled plants move, for there is no cilia to be discovered to act as paddles for these small boats. Kerner says: "The cell membrane is very hard and consists of two valves shutting together like the valves of a mussel. The strong analogy between the structure of these Diatomacæ and that of mussels seems to justify the assumption that the two siliceous valves, which are fast shut during the period of rest of the diatoms in question, move a little apart, so that the protoplast living within can push out one edge of its body and creep along over the substratum by means of it."

Living among the diatoms are one-celled animals which use the small plants for food. In the protoplasm of a Paramecium I once saw ten diatoms. The living part, that which Kerner calls the protoplast, is absorbed into the substance of the animal; the cell mebrane is cast out as refuse, and so it is that you will see many of these little boats quite colorless and drifting with every current. The one-celled animals are very numerous in species, and often have the power to move very quickly through the water, though at times they are firmly attached to the rocks or plants. One of the commonest of the stationary animals is the bell animalcule. It looks like a small transparent bell moored by a slender colorless rope. But this rope has a queer trick of looking all at once like a watch spring, and sometimes of disappearing altogether, and the little bell is held quite close to the anchorage. But even this animal, which must spend its life in one place and can only move up and down like a jack-in-the-box, lives upon diatoms and desmids, both of which have the power of moving from place to place.

Among the diatoms in our river you will sometimes see a crescent shaped boat with green instead of brown chlorophyll. This is a desmid, another one-celled plant which is much esteemed as food by many other animals besides the bell animalcule.

WILMATTE PORTER COCKERELL.



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HYDROYD CORALS.

Distichopora nitida (East Indies).

Millepora alcicornis (Florida).

Stylaster sanguineus (East Indies)

THE HYDROID CORALS.

The simplest corals belong to the class Hydrozoa. This class is divisible into two well marked divisions or orders; first, the Hydroidea, comprising the fresh-water hydra and the marine hydroids, and, second, the Scyphozoa or jelly fishes. A few species of the first order secrete a limy support, but the greater majority are soft and jelly-like.

The Hydroids have a more or less sac-like body which is usually attached to some object by a pedicel or stem of greater or lesser length. They are colonial animals, like true corals, and hundreds or even thousands live together in clusters, forming huge colonies. As in the sea anemones, the mouth is placed at the upper end and is surrounded by a row of hollow tentacles, which are very contractile and are seldom in the same position for more than a few seconds. A few of the Hydroids are capable of locomotion and move about very slowly by a gliding motion, and the fresh water hydra has even been seen to move by standing on its head. The larger number, however, are stationary and remain in one place after leaving the young stage.

There are three genera of these corals which secrete a limy support or corallium, one of which, Millepora, has contributed largely to the formation of coral reefs. The pink coral, Stylaster sanguineus, is a familiar example of the stony Hydroids, and lives in the East Indian seas. It is one of the most beautiful of all the corals, its soft pink color and delicate, branching form rivaling even the precious coral, with which it is, indeed, confounded by many people. Another Hydroid, Distichopora nitida, is an inhabitant of eastern seas, and varies in color from violet or red to almost black. It is more solid than the pink coral, hence much easier to preserve. The Millepora alcicornis is an American species living in the waters of Florida and the West India islands, and the corallium frequently grows to large dimensions. It is of a light yellow or cream color, and the surface is thickly covered with small holes, or pores, whence the name Millepora, each one of which was once the home of a little polyp. Each little depression or cup is shallow, but if a section be cut through one of the depressions it is seen to be a rather deep hole which has been successively partitioned off by the polyps, as one generation succeeded another. In other words, these cells are built in stories or series.

A very interesting and remarkable fact concerning these stony hydroids is that the animals or zoöids are not all alike nor do they perform like duties. We have here an example of the division of labor. For example, there is one kind of zoöid whose duty it is to digest the food, another kind possesses tentacles and secures the food, while a third kind is reproductive and perpetuates the species. This division of labor is very curious, and is a suggestion of that greater division which we find in the higher animals, where each function is performed by a distinct and separate organ.

The larger number of Hydroids are without a limestone support, their soft bodies clinging to some foreign body, as a shell, stone, or piling, either singly or in clusters. A small Hydroid which inhabits the coast of Massachusetts frequently encrusts the shells of mollusks, which in turn may be inhabited by a hermit crab.

The most familiar Hydroid to those people who live away from the sea shore is the fresh water hydra. This animal is very small, so small indeed that it can barely be seen with the unaided eye. When it is magnified it is found to have a cylindrical body, attached by one end to a submerged branch, leaf or stone. The free end contains the mouth, which is surrounded by a row of six or eight small, hollow tentacles. When at rest the hydra contracts until it is a short, globular body, the tentacles being short, blunt and club-shaped, but when the animal is active and expanded the body is long and cylindrical, and the tentacles are long, narrow and constantly twisting about. Should an insect or other minute animal chance to stray his way when the hydra is active, it is quickly paralyzed by the lasso barbs or nettling organs and then drawn into the mouth by the tentacles. The hydra is not stationary, but is able to move from place to place by gliding along, being aided in this operation by a sticky fluid which is secreted by cells of the pedicel.

Like many others of the lower animals, the hydra is capable of wonderfully reproducing lost parts. For example, if a hydra be cut in two, each piece will develop into a perfect animal, and if it be sliced into thin rings or cut in longitudinal sections each piece will grow and form a perfect hydra. Specimens have been even turned inside out, and in a short time the animal has been able to digest food in a stomach made of the outside of the body. So well marked is this reproductive function that it is almost impossible to kill a hydra with a knife.

The Hydroids perpetuate their species in four different ways; first, by budding, in which a new Hydroid simply grows out from the older animal; second, by fission or a splitting up of the animal, as in hydra; third, by the formation of medusæ or jelly fishes; and fourth, by means of true eggs. The life history of a common Hydroid may be summarized as follows: the Hydroid develops a bud-like organ called a reproductive calycle, which produces small young called medusæ or jelly-fishes. These in turn produce eggs from which little swimming embryos develop. These finally fall to the bottom of the sea and grow into perfect Hydroids. It will thus be seen that the young Hydroid is never like its parent, but like its grand parent, the Hydroid producing jelly-fishes, and the jelly-fishes Hydroids. This is called by scientists the alternation of generations.

It will be seen by the above account that the species of this class of animals are dimorphic or have two forms. This is a very interesting fact and one that can be duplicated in but few branches of zoology. The Medusa or jelly-fish is very beautiful and of such a size as to be readily seen and examined. It consists of a bell or umbrella-shaped structure to which is suspended, in the center, a hollow stomach, and from this organ four canals radiate which open into a circular canal surrounding the edge of the bell-shaped structure. From the edge of this disk several thread-like tentacles hang down which contain lasso cells and have the same power of stinging or paralyzing their prey as do the coral polyps. In the Physalia, or Portuguese Man-of-War, these tentacles are often many feet in length. The animal has been known to cause the death of swimmers who have ventured into deep water, and have been benumbed by the multitude of darts thrown out by the tentacles. The Medusæ possess a well-marked ring of nerve matter surrounding the edge of the bell and they also have eyes and simple ears situated at various places on the edge of this disk.

During their development the jelly-fishes pass through fully as wonderful changes as do the butterflies from a caterpillar to the perfect insect; in fact, they pass through a metamorphosis. The Aurelia, a common New England jelly-fish, lays its eggs in the late summer. A month or so later these eggs have developed into a hydra-like animal called a scyphistoma, in which stage it remains for about eighteen months. At the end of this time the hydra develops a number of cup-like disks, tentacles bud out, and the animal assumes the strobila stage. One of these disks becomes detached, swims away and finally develops into the fully formed Aurelia, just two years after it was deposited as an egg from the adult Aurelia. This is so like the metamorphosis of the butterfly that we can almost match the changes stage for stage.

Few objects of the sea shore are as beautiful or as interesting as the jelly-fishes. If the seaside visitor takes a boat and rows upon a bay or the ocean, either by day or by night, he is sure to see one or more of these delicate, jelly-like creatures floating gracefully along, propelled by the rhythmic contractions and expansions of the bell-shaped disk. Now it will be seen to poise itself perfectly perpendicular in the smooth water, and again it will careen to one side and display its digestive apparatus, suspended from the center. If the creature be viewed in the sunlight it will appear of a beautiful blue color, iridescent from the flashing rays of the sun.

Those who have seen only the unsightly mass of bluish white jelly, as these animals appear when cast upon the seashore by the storms, can have no idea of their exquisite form and beauty. These animals are found in all quarters of the globe, even in latitudes of extreme cold, and no body of salt water of any size is devoid of them. In size they range from a fraction of an inch to over a foot in diameter. Their colors are generally bluish, looking not unlike transparent glass, and occasionally the four radiating canals may be seen through the disk and are colored bright red. Other colors of the Medusæ are purple, green and pinkish. In the Portuguese Man-of-War, the disk forms a somewhat cylindrical float, with a crenulated crest, on the upper surface, and the stomach (or polypite) and tentacles hang down from the under side. These tentacles or stinging feelers are more numerous in this Medusa than in the majority of species.

We have described the interesting case of the division of labor found in the Millepora, but there is a still more wonderful division of work in the colonial jelly-fishes, called Siphonophora.

These jelly-fishes are brilliantly colored and in many places, in the Mediterranean Sea for example, they cover the surface over quite an area during certain seasons. These animals have a central fleshy, flexible stem several feet in length, to which are attached many hundred polyps and Medusæ, arranged in sets, each set having a different duty to perform. The upper end of the stem is enlarged to form a float and around the stem, just below the float, are arranged a large number of bell-shaped Medusæ which alternately open and close, forcing water in and out of their cavities. These are the locomotive organs and by their pulsations they propel the colony from place to place. From the lower end of this stem a large number of polyp-like structures are suspended, divided into sets. One set is pear-shaped, and each polyp contains a long tentacle in which are placed nettling organs for capturing the food. There are also a large number of long, slender, thread-like organs present, which are special organs of sense. Finally there are the reproductive individuals whose duty it is to produce eggs for the perpetuation of the species. It will thus be seen that this colony of polyps and Medusæ correspond to or rather foreshadow the higher and more complex animals, where there is an organ for each function. Animals like these jelly-fishes are said to be polymorphic.

The bodies of the jelly-fishes are soft and jelly-like and cannot be well preserved for study. There is about one per cent of solid matter in their composition, the balance being chiefly water. This is the reason that they become such a shapeless, sticky mass of jelly when thrown on the sea shore or taken from the water. Should any reader of this article spend the ensuing summer at the sea shore, I would suggest that that one study carefully the jelly-fishes and sea anemones which are sure to be found if carefully searched for. The sea anemones will be found clinging to stones in pools left by the receding tide, or perchance will be discovered attached to the piling of a wharf or bridge. The jelly-fishes come in from the open sea and may be found floating near the shore or imprisoned in a tide pool. The first mentioned animals may be dislodged with a flat-bladed knife pressed between the object of attachment and the animal, but owing to their stinging powers, the Medusæ had better be picked up with a small net. These animals may be collected in pails filled with salt water and studied alive in marine aquaria. The information gained in this manner will be both interesting and instructive, and the time consumed will be well spent. To realize the true meaning of life, nature must be studied at first hand, when she will yield her choicest secrets to those who will earnestly seek for knowledge.

Frank Collins Baker.

THE ABERT'S SQUIRREL.

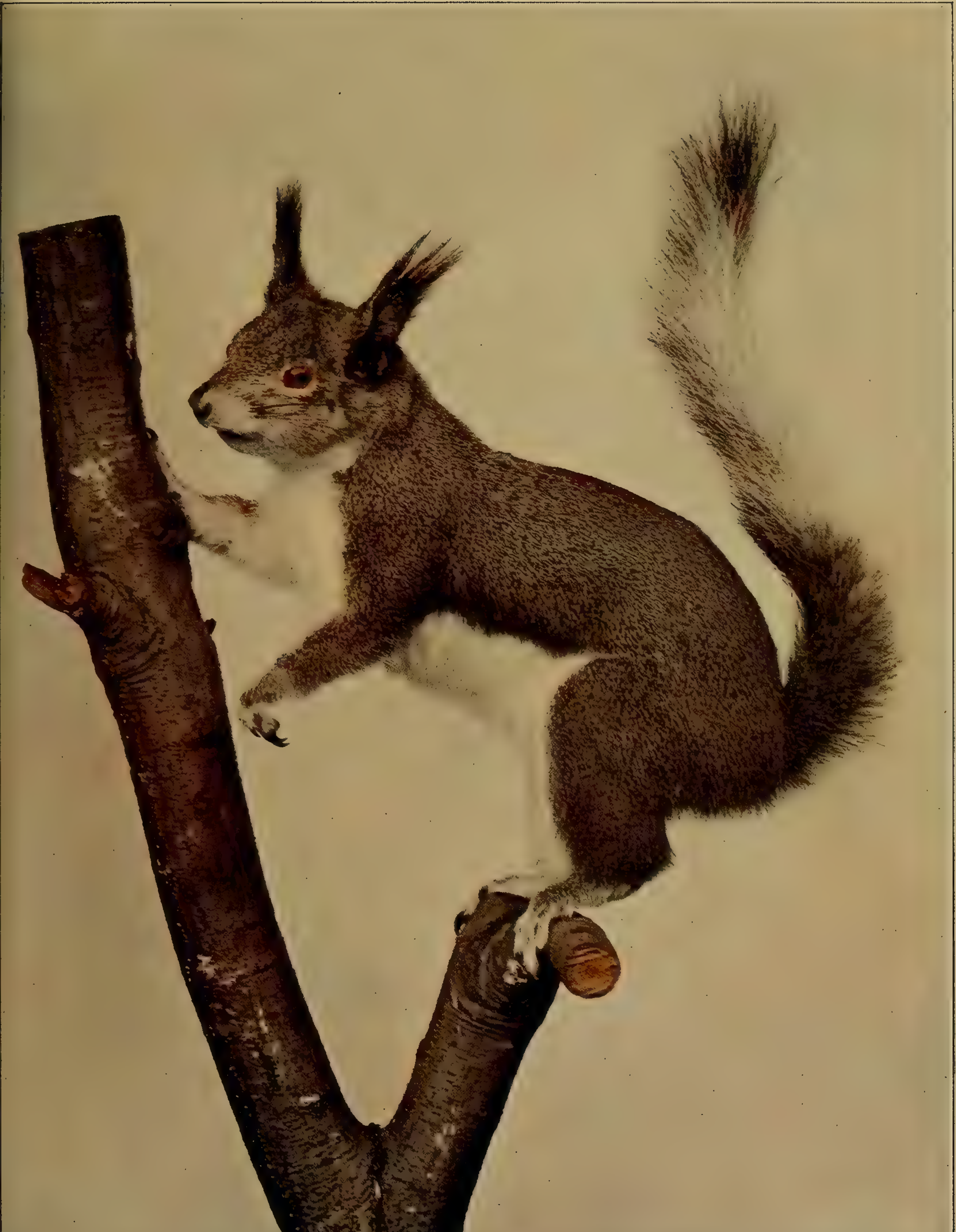
(*Sciurus aberti.*)

Abert's Squirrel is one of the handsomest as well as one of the largest of the American squirrels. Its range extends from central Colorado, southward through Arizona and New Mexico into Mexico. It is abundant in nearly every part of this region which is suited to its habits. The pine-covered sides of mountain ranges are its favorite feeding grounds, and it is rarely seen in other localities. Its food consists chiefly of pine seeds, but it also eats the acorns of the oaks which grow in the openings.

The beauty of Abert's Squirrel is greatly enhanced by its long, full tail and the tuft of hairs which crowns its high and narrow ears. These hairs are directed upward and sometimes form a pencil fully as long as the height of the ear. The tufts, however, vary greatly in length and may be entirely absent, for they are shed in the spring and the new growths do not obtain their full development until early winter. The fur is long, full and soft. The typical color on the upper half of the body is a bluish gray; on the back, there is a stripe of reddish or chestnut brown fur extending from the shoulders to the base of the tail; on the under side of the body, the fur is pure white in color and is separated from the gray of the back by a more or less distinct black line. Individuals, however, vary greatly in color. They will vary from a reddish-brown to a uniform black, throughout.

In spite of the fact that in its forest retreat it is well protected and is seldom molested by man, "it is often a shy and wary species, and when it discovers an intruder, leaps with great celerity to the top of the pines, whose size and dense foliage screen and protect it." It is a hardy and muscular animal. When cornered, or if wounded, it shows great determination, fighting valiantly and biting viciously. Even when "mortally wounded, it clings with surprising pertinacity, and for a long time, to its perch."

Dr. C. Hart Merriam has well described the habits of Abert's Squirrel in the following words: "It builds large covered nests of green pine branches, lined with soft grass, among the limbs of the trees, but also avails itself of holes in the trunks when suitable openings can be found. As a rule it is unwary and may be easily approached within short gunshot range; but when really frightened it runs swiftly over the lava rocks for a long distance before taking to a tree, often passing over the roots of many large pines in its flight. On reaching the tree of its choice, it climbs to the very top, and then, unlike any other squirrel with which I am familiar, crawls out to the small end of a branch, about which it curls and remains motionless. When in this position it is exceedingly difficult to see, though considerably larger than our eastern gray squirrel; and even the conspicuous white under side of the bushy tail is so coiled about the body as to aid in deceiving the observer."



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ABERT'S SQUIRREL.
(Sciurus aberti).
About ⅓ Life-size.

SOME STRANGE CREATURES.

A little animal found in Southern America, and bearing the name of liron, has almost all the characteristics of the sarigua, only that it is amphibious. It is on that account that it is called the little waterdog. It is a lovely little animal that lives in the rivers and pools. Its skin is covered with short hair, very soft and of extraordinary beauty. Its color is white and black, so disposed, that beginning with the head, it forms a ribbon of black hair which shows itself in the shape of a semi-circle, and then at the distance of two fingers forms another, then a third and a fourth, etc. As its radii are black on a white ground, they contribute very much to the beauty of the animal. Its little head is like that of a dormouse, with the whiskers of a cat. Its feet are webbed; its tail is very striking, and entirely without hair from the middle to its extremity. The belly of this animal is split entirely down, and divided into two long strips of skin which it opens and can shut so hermetically that the division is hardly to be perceived. These strips are lined with a soft and thick short hair. It is with them that the female covers as many as six little ones, which she carries under this thin cuticule.

There is also in South America, in the region of the Orinoco and other rivers, an amphibious animal which goes under a different name by the Caribs, the Spaniards and other tribes and races inhabiting the great districts not yet fully known. This is the chiquira, which has the nose of a sheep, red hair, and a tail so short that it hardly appears. The Indians eat it on fast days, because it lives as much in the water as on land. These animals swim in shoals and come up from time to time to breathe. They feed on the grass that grows on the borders of the rivers and lakes. It is there that the Indians wait for them with their arrows, for they are exceedingly fond of their flesh.

One of the most unfortunate animals in the world is the babakoto, as grown-up people with lots of time to spare like to call him, Indris brevicaudatus. We call him unfortunate, because he labors under the disadvantage of resembling a monkey without the chief joy of the monkey's life—the one that compensates the monkey for his lack of beauty—which is, in brief, the ability to swing about on trees with his tail. The reason why the babakoto cannot swing by his tail is that he has no tail worth mentioning, and it is no doubt due to this fact that all the babokoto can do is to sit on a tree and whimper and wail. If you wish to see the babokoto in the full luxury of his woe, you must go to Madagascar, whither he has gone to live, to be rid, no doubt, of the saucy apes of Central Africa, who are said to have made cutting and uncomplimentary remarks about his caudal shortcomings.

In the middle of Africa is found an ape which builds a shelter for himself in a tree, and so he is called the house-building ape. He selects a tall tree growing nearly straight out, and about twenty feet from the ground. This branch is for his floor, and over it he makes a roof, exactly in the shape of a large umbrella, with the trunk of the tree for the handle. It is made of leafy branches, tied on to the tree with vines, of which African woods are full, and is so well shaped and neatly made that it would do credit to a human builder. When the ape is at home, he sits in the branch with his head up under the green roof, and an arm around the trunk to hold on. One animal lives in each house alone, and he uses it only until he has eaten all the food near by that he cares for. Then he builds a new house in another place.

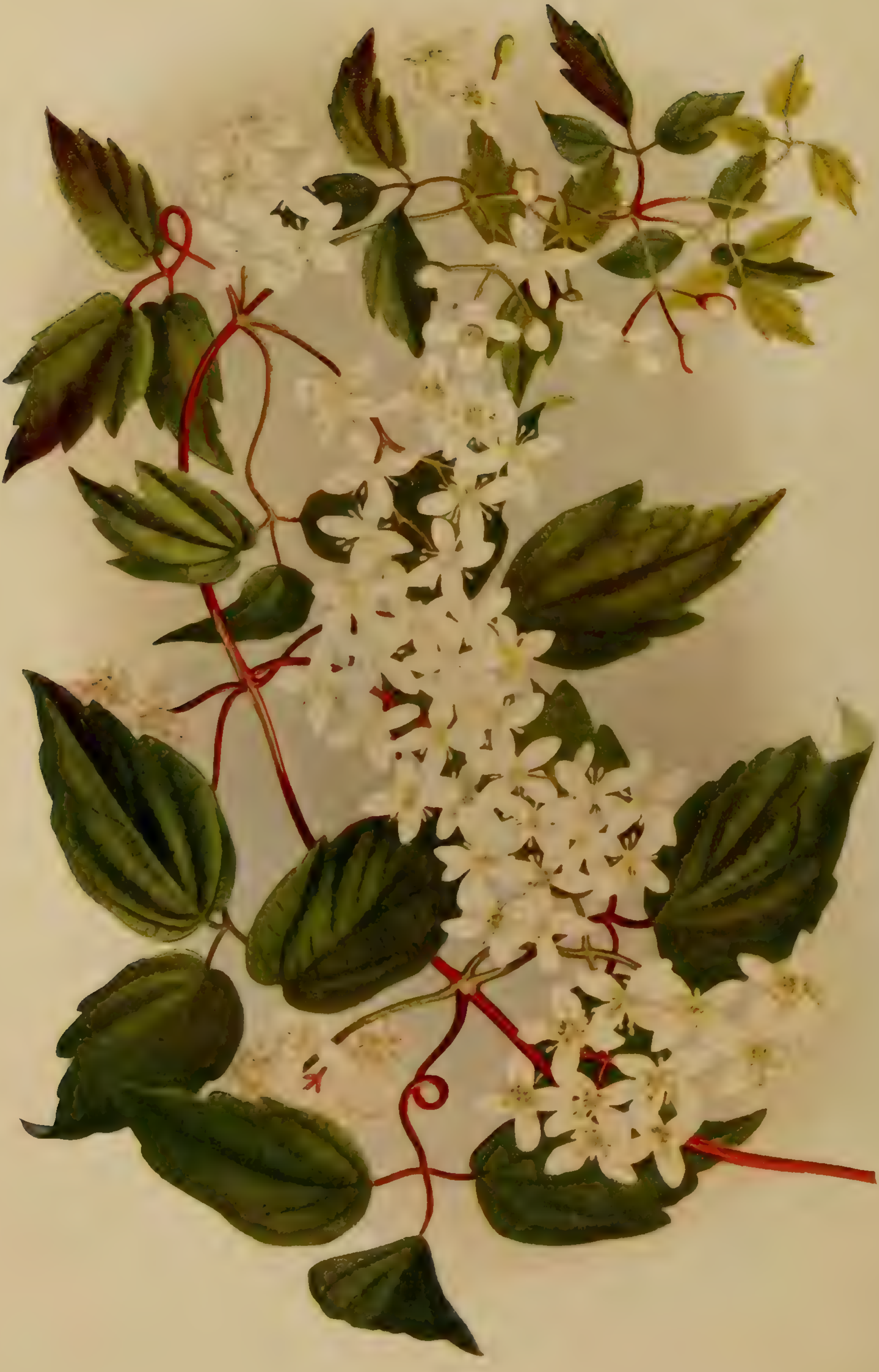
One of my neighbors brought me, the other day, a wheel-mole, or more properly a star-nosed mole, which he had caught in his cellar. This curious little subterranean delver has the end of the nose surrounded by twenty-two movable fleshy filaments, radiating in the form of a star, which serve as delicate organs of touch. It has a stout, thick, clumsy body without visible neck, no external ears, and is covered with short, velvety and compact fur. It is generally believed that the mole is blind, but this is an error. Its eyes are two black, glittering points, about the size of a mustard seed, concealed and protected by the surrounding skin and hair. Living under ground all its organs are protected from the entrance of the earth in this way. This mole can scarcely be said to have legs. It moves on its belly, but has side hand-like fins, with which it shovels away the dirt. Its fur is so fine that it has been employed in making artificial eyebrows. In England mole-catching is a regular trade followed by a singular class of men, who acquire a silent, stealthy walk and a bent posture from their habit of stooping to look for the runs of the mole.

George Bancroft Griffith.

A GOLFING CLERGYMAN.

In the damp woods, where the wild things grow,
Jack in the Pulpit holds forth, you know,
Drapper and clerical, fair to be seen,
Clothed in his gown of well fitting green.
Demure Quaker ladies sit at his feet,
While timid young violets take a back seat.
His eloquence pleases, for see, as he talks,
The dainty anemones sway on their stalks.
But visit him once in the fall of the year,
And you can't but admit that our preacher looks queer,
So fat and so rubicund, jolly and gay,
Hard work must agree with him, or is it play?
His pulpit has vanished, his audience too,
And Jack wears a coat of a bright scarlet hue.
He must be a golfer, and plays without doubt,
With the tiny puff balls you see scattered about.
Perhaps he's a smoker, for there at his side
An Indian pipe he's trying to hide!
But never mind, Jacky; I'm able to state,
Though you live in the woods, you are quite up to date.

Bessie Andrews Dana.



BY PERMISSION OF KNIGHT & MILLET, BOSTON.

COMMON CLEMATIS.
(Clematis virginiana)

FROM "WILD FLOWERS OF NORTH AMERICA."

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TWO BEAUTIFUL VINES.

There are two vines which we can find in our wild woods, that are as pretty and unusual as any exotic brought from foreign land. We may praise and admire the purple Japanese Clematis which makes our yards and lawns so beautiful with its great masses of brilliant blossom in July and August, but it is not a whit more beautiful than the Clematis virginiana or Virgin's Bower; or the Clematis viorna or Leather Flower, would be, if they, too, were transplanted from their native woods and tended and fostered by loving care. The Virgin's Bower is getting to be a rather popular vine in cultivation, and there is no more lovely sight than to come upon in our walks and drives large quantities of either of these varieties of Clematis.

The Clematis viorna, or Leather Flower, is more frequently found in rich dark places,, though I have found it on the open roadside, climbing from ten to fifteen feet high over fences and trees; its stems are slightly ridged or grooved; its leaves usually compound, the upper ones being often found simple and stemless, with from three to seven leaflets that are two, or three, lobed and nearly smooth. Its flowers are very peculiar, being of a dark pinkish purple in color, with no petals; its sepals are about one inch long, very thick and leathery, cohering throughout, except that its tips are turned back and are a little egg-shaped or pointed; it has a great many stamens and anthers. There is another variety of Clematis that is rarer than this, but resembles it very closely: the Clematis pitcheria, or Pitcher Plant.

The Clematis viorna is surely well worth our knowing and study, not only for its odd and curious flowers, and beautiful foliage, but for its fruit, with its plume-like tails of pure white often one and a half to two inches long.

The other variety, Clematis virginiana, or Virgin's Bower, Traveler's Joy or Old Man's Beard, as it is variously called, is a much more common variety and may be found in great abundance climbing over bushes and along walls and fences, in nearly all woods, from Canada to Georgia, and the Mississippi river, growing mostly in hilly, rocky places.

It climbs by the help of its twining and interlocking leaf and leaflet stems, and is a woody, hardy vine, climbing like the Leather Flower from ten to fifteen feet high. It has opposite compound leaves on stems two or three inches long, with three leaflets and toothed edges; sometimes lobed, two or three inches in length, and with a pointed apex. In August and September we will find this vine one mass of snowy white flowers, about three-quarters of an inch across, growing in loose, smooth clusters from the axils of the leaves. Like the other Clematis, it has no petals, but four white sepals resembling petals and numerous stamens, often twenty-eight or thirty in number, bearing short, blunt anthers.

The staminate and pistillate flowers are found on separate plants, which accounts for our finding sometimes a bush that is a mass of blossom, another bearing its blossoms sparsely scattered along its branches. One is the staminate and the other the pistillate plant. When it is in full bloom, the foliage will be almost hidden by the snowy blossoms, while late in the fall it will be again eclipsed by the white nodding plumes of the seed pods, that when you find a tree covered with it, looks like a drift of early snow. It is from its seed pods that it gets its name of "Old Man's Beard." Charles Darwin, in his study of "Movements in Plants" (which we all would enjoy reading), made a close study of the many varieties of Clematis.

These are but two of the many beautiful vines that are to be found in our woods, yet there are a great number of others just as beautiful, the bindweeds, passion vines, bedstraws, convolvulus, etc., all of which will well repay us to examine and study.

Jennie Owen Cochran.

CLEMATIS.

(*Clematis virginiana* L.)

The term Clematis is commonly used in a generic sense, referring to a number of species. They are perennial herbs or vines, rather woody, and climbing by the bending or clasping of leaf-stalks. The leaves are pinnate, variously cut or lobed, opposite; the flowers are showy, variously colored, and with only one floral covering, namely the calyx (sepals), the corolla (petals) being wanting or rudimentary. The various species belong to the Crowfoot family (Ranunculaceæ).

The plants are extensively cultivated as ornamental plants. The common Clematis, Traveller's Joy or Virgin's Bower, is a climbing plant, with three smooth leaflets which are more or less cut or lobed and heart-shaped at the base. The flowers are white or whitish. It is quite common along river banks and flowers in July and August.

Clematis has been known and cultivated for many centuries. Several species were known to Dioscorides. It has figured extensively in folklore. Gerarde says: "The Virgin's Bower is worthy to be so called by reason of the goodly shadow which the branches make with their thick bushing and climbing, as also for the beauty of the flowers, and the scent and savour of the same." In the language of flowers Clematis signifies artifice and mental beauty. On the continent of Europe Clematis erecta and Clematis flammula are used by beggars to produce artificial ulcers on their limbs to incite pity. In America, according to Geyer, the roots of a species of Clematis are used by the Indians as a stimulant to horses which fall down at the races. The scraped end of the root is held to the nostrils of the fallen animal, which begins to tremble, and then rising is conducted to water to refresh itself.

As already indicated, there are many species of Clematis in America, Europe, Asia and India, and in other countries and islands. Besides the many culture varieties derived from wild species directly, there are numerous varieties the result of artificial crossing (cross pollination) of which the following are perhaps the most handsome: The Jackmann, John Gould, Lucy Lemoine, Miss Bateman, Prince of Wales and Sir Garnet Wolseley.

Clematis makes beautiful arbor plants and may be trained to almost any sort of support. They require considerable sunlight and fairly good soil. They are propagated from cuttings and grafting.

ALBERT SCHNEIDER.

AFTER TWILIGHT.

(*From the Latin.*)

'Twas night,
And all life
Dreaming in repose, was still;
The fields—the wood—the mountain rill.
The beasts,
And many tinted birds,
The fishes in the lakes,
The herds.
The golden stars sailed on,
And sorrow,
Care,
And sin had gone.

(21)

—JAC LOWELL.

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